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PART I.

ORIGINAL COMMUNICATIONS.

ART. IX.—*On the Nature and Treatment of Epilepsy.* By ROBERT J. GRAVES, M. D., F. R. S.

THAT epilepsy is not necessarily connected with perceptible change of structure in any portion of the nervous system has been abundantly proved, not only by the later investigations of others, but by the cases I myself long since published. A knowledge of this fact, pathologically so important, ought to encourage physicians to persevere in searching for remedies capable of alleviating or curing this distressing malady, for where organic disease does not necessarily exist there can be no insuperable impediment to recovery.

The following cases are brought forward partly for the purpose of recording the effects of the *Cotyledon umbilicus*, first recommended by Dr. Salter, of Poole, and partly with the view of detailing the symptoms of some rare and instructive varieties of the disease.

Case I.—*Epilepsy of several years' duration cured by the Cotyledon*[a].

Mr. J. M——, now aged 22, had an attack of measles in 1847, followed in four months by a slight fit of epilepsy at night. The epileptic seizures soon became more violent, and finally recurred at intervals, seldom longer than two or three weeks. In March, 1849, he was placed under the care of Dr. ——, of Castlebellingham, who had him leeched frequently behind the ears, and gave him at first aperient, and subsequently tonic, remedies. This course of treatment having been tried for six months, without any benefit, he was then removed to Belfast, where he consulted another physician, who ordered sea-bathing and shower-baths, which were persevered in for half a year without the least improvement. In January, 1850, he was advised to come to Dundrum, near Dublin, when Mr. White gave him a fourth of a grain of iodide of silver three times a day, and established a perpetual blister on his scalp. After these remedies had been continued for five weeks, he got scarlet fever, for some months after which he remained free from his former ailment, and his parents flattered themselves that he was cured. In June, however, the epilepsy recurred as severely as ever, and, consequently, he again solicited Mr. White's advice, who, finding that the severity of the disease was unmitigated, consulted me on the 12th of July, the patient having experienced an unusually violent seizure on the preceding day. I advised the exhibition of the extract of cotyledon umbilicus in five-grain pills, three to be taken three times a day. These pills were continued for two months, when, as there had been no recurrence of the fits, we ordered him to have two pills three times a day, and at the end of two months, the fits not having re-appeared, we were enabled to diminish the dose to one pill; at the end of six months all medicine was discontinued, and he has continued ever since, a period of more than two years, quite free from the complaint. I should have men-

[a] Communicated by Surgeon White, of Dundrum.

tioned, that there is nothing in this gentleman's appearance indicative either of plethora or debility.

Case II.—*Frequently recurring Epilepsy in a boy of four years old, cured by Cotyledon umbilicus.*

This boy, of full habit and very nervous temperament, had been subject to epilepsy for more than a year, when I was consulted about his case by Mr. Pakenham, of Henry-street. The disease had latterly become much worse, the fits returning several times in the week, and often followed by excitement of an almost maniacal character. I prescribed a treatment directed against the tendency of blood to the head, and carefully attended to the state of the stomach and bowels, while great attention to diet, and removal from everything exciting, were strongly urged by me, and by the parents rigorously enforced. After some continuance of this general preparatory course, we had recourse to various anti-epileptic remedies, a succession of which was unavailingly tried for many months; and it was not until our patience had been worn out, and all hopes of a cure abandoned, that it occurred to me to try the extract of the cotyledon umbilicus. The good effects of this remedy were very striking, and after it had been persevered in for a few weeks, the child's health was perfectly restored. On one or two subsequent occasions a relapse took place, which was speedily cured by the cotyledon, and the boy has remained robust and free from all nervous symptoms for two years.

Case III.—*Recent Epilepsy in a young man; Exhibition of Cotyledon umbilicus without any benefit.*

During the summer of 1851 the eldest son of a gentleman of rank was placed under my care. He was twenty-three years of age, and had been quite healthy until within a few months previously, when the epileptic seizures commenced, and, as usual, first attacked him when asleep. Since that time he has had a fit every three or four weeks, and but only once during the daylight. The short duration of the complaint previously

to his being submitted to treatment rendered me sanguine as to the beneficial effects likely to be produced by the cotyledon, and accordingly I commenced its exhibition with much confidence. I was, however, disappointed; for although the extract used had been carefully prepared, and the patient was most regular in taking the medicine, yet not the least advantage was gained. He at length became discontented, and had recourse to other advice, with what result I know not.

Case IV.—*Epilepsy of long standing; Partial relief from the use of the Cotyledon.*

A young woman, residing in Mitchelstown, had been for several years subject to epilepsy. The fit, as is frequently the case, recurred at nearly regular periods of seven weeks, and then the first and severest attack was succeeded, during the following five or six days, by three or four fits of less intensity.

This periodicity of epilepsy has been noted by many authors, but no one that I am aware has pointed out the important consequences to which it manifestly leads. A close attention to the effects produced by medicines in periodic cases has led me to the discovery of the following rule in practice.

The general and constitutional management of such patients must be persevered in at all times, and without reference to the periods; *but the specific treatment*, i. e. *the exhibition of remedies calculated to abate the violence of or avert the occurrence of the fits themselves, must be limited to the eight or ten days which precede that period.* If they are continued during the whole interval between the groups of fits, the constitution inevitably becomes accustomed to their influence, and when the time of need arrives they are powerless. On a former occasion I adduced proofs that this rule applies to the treatment of obstinate ague relapses with sulphate of quina.

But to return to the case in hand. The young person in question, having previously tried various medicines, took the

cotyledon according to my rule, and with the manifest good effect of delaying the next period at least four weeks, and diminishing the violence of the fits. Whether anything like a permanent cure would have been brought about by a steady perseverance, I am unable to say, as the patient's means did not enable her to procure more of the extract.

Case V.—*Epilepsy, both in a regular and irregular form, occurring in a young man ; not relieved by Cotyledon.*

A youth of 18, with a strong hereditary tendency to scrofula, had a severe strumous affection of the knee six years before; after the subsidence of which he enjoyed good health, until he had attained the age of 16. He was then attacked with an anomalous form of epilepsy, whose origin he traces to a vicious habit contracted at school. In addition to the ordinary convulsive fits, which usually came on at night, he is subject during the day to a singular nervous affection. This attacks him frequently when he is quietly sitting by the fire, and only lasts for a few seconds, during which he is unconscious, but seems to stare at those around him, and sometimes whirls himself about on his chair, or rises up and walks a few steps in a hurried manner; at other times he raises his legs suddenly while he is seated, and sweeps them along the table. All the remedies of most character, and among them the cotyledon, were tried in vain in this case.

Case VI.—*Epilepsy ; Failure of the Cotyledon.*

A girl, aged 13, is subject to occasional attacks of epilepsy at night, but they occur only at very distant periods. The most remarkable feature in her ailment is the derangement of the nervous system exhibited during the day, which consists in sudden but very transient fits of unconsciousness, which seize her three or four times while awake. If the fit comes on while she is walking, she generally stops, and appears to stare anxiously; sometimes she walks on.

In this patient the cotyledon entirely failed.

In connexion with this form of epilepsy I may remark, that I have seen several patients in whom this transient unconsciousness formed the only symptom of disease discernible, and yet there could be no doubt that it was truly epileptic in its nature.

Case VII.—*Epilepsy originating in loss of blood.*

A gentleman, aged 25, had always enjoyed good health, with the exception of occasional attacks of epistaxis. One of these being unusually violent, and not yielding to the ordinary treatment, the attending practitioner thought it prudent to use venesection. This stopped the bleeding from the nose, and matters assumed a most favourable appearance, when unluckily the bandage loosened during the night, and the patient awoke bathed in blood. Immediately after the bandage was secured he was attacked with convulsions, which returned several times within the next few days. Since that period this gentleman has been subject to violent attacks of regular epilepsy, which all treatment has failed to cure, though in the course of the fourteen years which have elapsed he has been under the care of various medical men, including myself.

This singular fact, for the accuracy of which I can vouch, is extremely instructive, proving not only that epilepsy may arise from causes producing debility, but that shocks to the system, imparted by causes acting only for a brief period and suddenly, may lay the foundations of long-continued disease. The connexion between uterine hemorrhage and convulsions is familiar to accoucheurs, and I had lately an opportunity of observing a patient in whom excessive loss of blood from the bowels was followed, after an interval of four days, by fatal convulsions. This case I saw in consultation with Dr. Harvey, and it is remarkable that although the lady was so weak that she had not ventured to leave her bed, yet an hour before the first paroxysm of convulsions she said that she felt better than at any time since her illness, neither had she complained at

all of vertigo, tinnitus, or headach! *So that there was really nothing to warn the practitioner of the coming danger*[a].

In this patient Dr. Harvey very justly attributed the hemorrhage to over-anxiety of mind arising from the illness of her sister, a cause by no means improbable, for most medical men have witnessed instances of bleeding from various organs produced by affections of the mind. The following example is so remarkable that I must seize this opportunity of recording it. Many years ago, Surgeon Corr consulted Dr. Stokes and me respecting a dangerous spitting of blood in a relation of his own. It appeared that, nine years before, this young man had been seized with hemoptysis, in consequence of the operation of some of the usual causes of this affection. The day of the attack happened to be his birthday, and each successive birthday for the nine following years was disastrously marked by the recurrence of the spitting of blood!! After recovering from each attack, he remained free until his following birthday. The tenth was followed by rapid consumption.

Case VIII.—*Epilepsy from Grief.*

Dr. Harvey has communicated to me the following very interesting particulars which occurred in a patient of his:—A

[a] [While this article was going through the press a case occurred in our practice strongly corroborative of the views here propounded as to the effect of fright suddenly giving rise to epilepsy. It was that of a young lady who had for years laboured under an aggravated form of flatulent gastralgia, and whom Dr. Graves had frequently seen in consultation with us. On the evening of Friday, August 27th, she was sitting with her mother at the window, talking cheerfully, having been rather better during that day than for some days previously; a small cannon was suddenly fired off close to her ear by some boys in play; she immediately screamed aloud and fell down in an epileptic fit, from this she recovered, and had a pretty tranquil night. In the morning the same boys discharged the cannon close to her bed-room window, when the epileptic fit again seized her with the usual preceding shriek. From this time until her death, which took place on the following Monday morning at 8 o'clock, the fits recurred all but incessantly, there being only a few hours' freedom from them on Saturday and on Sunday morning, when she was perfectly sensible.—Ed.]

young gentleman at a boarding-school lost his brother, who died rather suddenly. This event gave rise to intense grief, which occasioned convulsions, occurring so frequently that the boy was obliged to leave the school. It was soon found that regular epilepsy had been developed, and in a severe form. Various remedies were exhibited in vain for several months, when it was judged expedient to try the effects of oil of turpentine. After it had been used for a few days it unexpectedly acted as a *vermifuge*, and expelled a tapeworm, from which time the epilepsy never re-appeared! Here, then, we have an instructive example, proving that a source of irritation may exist without producing sympathetic disease, but yet capable of keeping up nervous symptoms when the latter have been caused by other agencies!

In conclusion I may remark, that the preceding cases illustrate some questions connected with the pathology and treatment of epilepsy, and likewise prove that in the Cotyledon umbilicus we possess a remedy capable of materially aiding our curative efforts in certain varieties of the disease. In derangements of the nervous system there are so many shades of intensity, and so numerous are the differences of cause which produce groups of symptoms, apparently but not really identical, that it is in vain to look for very definite or constant modes of treatment, and we must therefore seek for remedies, numerous as are these differences. We already possess medicines of great power in the treatment of epilepsy, but not one which does not frequently fail; and consequently the addition to this list of a new substance is a valuable acquisition. It may be well to add, that in Ireland the cotyledon has been long known as a popular remedy, not only for epilepsy, but for asthma.

Art. X.—*On the Administration of Mercury in Cases of Cancrum Oris.* By James F. Duncan, M. D., Fellow of the College of Physicians in Ireland, Physician to Sir P. Dun's Hospital, &c.

In the last volume of the First Series of this Journal I directed the attention of the profession to an epidemic of gangrenous stomatitis which occurred among the younger inmates of the North Dublin Workhouse, and which I had an opportunity of observing in consequence of the office which I then filled as physician to that institution. In doing so I ventured to suggest certain reasons for considering the disease as essentially similar to the better known affection Cancrum Oris, if it were not really a milder form of the same complaint. But the principal object I had in view in writing the Essay was to call attention to the fact that mercury could be administered with safety in an affection which presented so many points of resemblance to the ordinary action of that mineral upon the system. It is scarcely necessary here to state, what must be familiar to every medical practitioner, namely, that a strong and very natural prejudice exists against the exhibition of the slightest particle of the mildest preparations of mercury in Cancrum Oris, and that many persons are impressed with the idea that the production of local gangrene in these cases is entirely the result of the unfavourable influence of that medicine upon a constitution not adapted to receive it kindly. The perfect fallacy of this idea has been clearly established, in my opinion, by arguments which it is not necessary now to recapitulate; but it cannot be denied that the question is sufficiently important to be entitled to all the further elucidation that it is capable of receiving. And no argument appears to me to possess greater weight in removing this error than a clear proof by well authenticated instances that mercury may be administered in these cases when the ravages of gangrene exist, without injury to the patient. For if the mineral really exercised the noxious influence it is

supposed to do upon those individuals whose constitutions are in the unhealthy condition which forms a necessary element for the production of the disease, it must be obvious that even a small dose administered during the progress of the complaint must be productive of immediate and apparent injury, unless we adopt the homœopathic maxim, "similia similibus curantur," and then, contrary to the universal feeling of the profession, mercury would be the very remedy to be used.

In reasoning upon medical subjects, it must never be forgotten that it is extremely difficult to determine what are really the *causes* of disease. In natural philosophy such a problem can in general be determined with little difficulty and with perfect certainty, because we have it always in our power to institute such a series of experiments as will, by eliminating every circumstance that is purely accidental in the case, enable us to discover what is fixed, uniform, and constant, which, of course, may be assumed as the cause of the effect under consideration. Even in physiology, although the complicated and obscure nature of vital action renders the solution somewhat more difficult, it is still possible to determine such a question with tolerable exactness. But the case is altogether different when we come to deal with questions in pathology, for this simple reason—that we no longer have it in our power to multiply *ad libitum* the subjects of experiment. Nature must first furnish us with materials to operate on before we can proceed a single step in our investigations. And it is unnecessary to say, that the slightest variation in the condition of the subjects of the experiments may alter entirely the whole aspect of the proceeding, and render the labour that has been bestowed upon it abortive. It is easy at any moment to procure a healthy man of any required temperament, age, habit, &c., so as to ascertain, if need be, the physiological properties of any drug or other remedy upon the system. But to get a man in a certain pathological condition, just at the moment that our necessities require his services, to investigate an interesting pathological problem,

is not to be thought of. Now, this has been precisely the difficulty I have had to contend with ever since the publication of my former paper. Though anxiously desiring to ascertain the correctness of my views on this important subject, I had no opportunity of witnessing a case of Cancrum Oris until I met with the one about to be detailed. So far as my former paper went, it appears to me to set the question in a great measure at rest, if it be admitted that the affection there described was a milder form of cancrum oris; but as this is a point concerning which differences of opinion may exist, it is plainly desirable that so important a question in pathology as the safety of thus administering mercury should be established by cases concerning which no manner of doubt may remain.

Perhaps it may be asked, what is the precise object expected to be gained by the administration of mercury in Cancrum Oris? Is it supposed to exercise a specific influence upon the state of the constitution, or merely a local action upon the ulcer disposing it to heal? Before proceeding to reply to this question, I would observe, that if, without the slightest benefit being produced to the patient, it can be satisfactorily shown that mercury does not exert that terribly injurious effect upon these constitions that it is commonly supposed to do, a very important step will be gained, because it will set at rest that disputed point as to the actual cause of the complaint which has been the source of so much injury and inconvenience to members of the profession who have had the misfortune to have cases of the disease under their care. Still further, I think it a matter of great moment to show, that in cases where serious complications exist, such as inflammation of the lungs, a case of which occurred in Dr. Marshall Hall's practice, we are not entirely debarred from the use of a medicine which under other circumstances we should feel ourselves called upon to prescribe. But to return to the question that has been started. I certainly would not prescribe mercury in all cases of Cancrum Oris, neither would I give it as a specific, but simply with a view to

correct the alvine evacuations, which I have uniformly found in an unhealthy state; and I would give it, I need scarcely add, with the greatest circumspection, and with precautions to be subsequently noticed. If this state of the digestive organs did not exist, I certainly see no reason for resorting to its use. The view of the pathology of these cases which I have been led to form is this,—that there is deep-seated derangement of some of the organs connected with the digestive apparatus, as evidenced by the unhealthy character of the secretions, and that this manifests itself in the same way as other disorders of the alimentary canal do, by a prominently morbid action going on near the orifices of the tube. Whether this idea be correct or not, certain it is, that the discharges from the bowels are, in my experience, uniformly unhealthy, and it is for the correction of this state of things that I consider the cautious exhibition of the milder preparations of mercury useful. But in ordering so depressing a remedy, it is of vital consequence that the patient's strength should be duly supported at the same time, by such nourishment as he can take, by suitable tonics, and by the free use of wine. And this observation applies equally to all states of the system when the constitution is broken down, or the vital forces are impaired by disease, fatigue, disappointment, or the depressing passions generally. Wherever, under such circumstances, the use of mercury becomes necessary, the greatest care must be taken to correct its lowering effects by the steady exhibition of appropriate stimulants.

I shall now proceed, without further preface, to detail the case as briefly as possible, and then conclude with a few observations.

George Desby, a boy eight years of age, ill of fever, was admitted into Sir P. Dun's Hospital on the 17th July, 1852, and in consequence of the closure of the clinical wards for the summer, was transferred to my care on the 19th. He had been leeched in the epigastrium, and had taken a diaphoretic mixture containing nitre, before I saw him, when he was la-

bouring under considerable fever, the head hot, and the pulse weak. He was ordered three grains of hydrargum cum creta, with aromatic powder, three times a day, and the cautious use of a small quantity of wine largely diluted directed. On the 21st July, the symptoms of cerebral excitement having subsided, the powders, of which he had taken five, were omitted, a teaspoonful of castor oil was directed to be taken, and the wine to be continued.

July 22. The pulse 108, feeble; the skin cool; the eyes have a sunk and extremely heavy expression. The right cheek is somewhat swelled, the skin of a rose-pink colour, as if varnished over; on examining the inside of the mouth there was observed a black slough close to the commissure of the lips, of the size of a sixpence, and the gums of the opposite teeth on that side were ulcerated. There was a strong gangrenous odour from the mouth. He was ordered four ounces of wine and chicken-broth; and to take every third hour a teaspoonful of a mixture containing four grains of sulphate of quina in two ounces of simple syrup. The ulcer to be touched with strong nitric acid.

July 23. Got the night tolerably well. Pulse 108; bowels moved once in the night and once this morning; evacuations dark and slimy. Took all the wine, which agreed with him. Got beef-tea and the quina. Slept a good deal. Appears somewhat improved. Eyes less sunk. The right cheek rather less swelled; colour of the external surface rather pale. Ulcer and fetor of breath as before. To have six ounces of wine, and the ulcer to be again touched with strong nitric acid. Other treatment continued.

24th. Slept very little; was crying all night. Is sleeping quietly now. Face more swelled, and red. Pulse 132, weak. Bowels moved three times; evacuations somewhat improved, solid, but of a dark colour. No improvement in condition or extent of ulcer, which seems spreading. To have twelve

ounces of wine, and the ulcer to be touched with creasote. Other treatment continued.

25th. Slept well. Got sixteen ounces of wine since yesterday. Pulse 120, weak. Bowels disturbed seven or eight times; evacuations dark and fluid, almost black. Ulceration of cheek not arrested. Tongue clean. Hungry, but unable to eat. Relishes milk. Ulcer again touched with strong nitric acid. To take half-a-grain of calomel and a sixth of a grain of opium three times a day, and a large spoonful of the following mixture: chalk mixture, four ounces and a half; tincture of catechu and tincture of cinnamon, of each two drachms; tincture of opium, twenty drops; and syrup of ginger, an ounce.

Half-past six o'clock, P. M. Has got but one powder and one dose of the mixture. Does not like the wine as well as he did. Took two ounces since the morning visit. Face rather more swelled on the right side; upper portion more inflamed. Bowels moved once; evacuation reported to be of a blackish appearance. Slept a good deal. Relished some rice-milk. Pulse 112, after getting an additional ounce of wine. Treatment to be continued.

26th. Got a good night; slept well. Pulse 112, weak. *Ulcer not worse, nor more extended.* Has taken four of the powders. Bowels moved three times since yesterday morning; evacuations fluid and *bilious* this morning. Some perspiration over him. Says he feels better to-day. Took only nine ounces of wine since yesterday morning. Treatment to be continued.

27th. Pulse 120, small; did not rest well; skin cool. Bowels twice disturbed yesterday; not at all since five o'clock this morning. Evacuations as yesterday. Urine clear and healthy looking. Has taken seven powders in all. Takes very little food, and can scarcely be got to take the wine ordered for him. Treatment to be continued.

28th. Got a good night; countenance slightly improved; pulse 108. Appearance of ulcer improved somewhat; swell-

ing of cheek diminished externally. Took about eight ounces of wine with water since yesterday, also a little chicken-broth and part of an egg. Bowels not moved since yesterday. Calomel to be omitted. To take two grains of Dover's powder and four grains of compound chalk powder every third hour, and the ulcer to be covered with a linctus consisting of an ounce of solution of chlorinated soda, with sufficient honey.

29th. This morning the expression of countenance is not so good; he got a bad night, and slept scarcely at all; was moaning constantly. Pulse 108. Bowels not moved. Took very little wine or nourishment. A small black spot occupies the centre of the right cheek on the external surface; the margin immediately surrounding it is a good deal inflamed. Dover's powder, &c., to be continued; camphorated spirit lotion to be applied to the cheek; the wine and nourishment to be continued.

30th. Pulse 108; slept well. Gangrenous eschar on right cheek much larger. Took seven ounces of wine, and beef-tea. Bowels not moved. Fermenting poultice to the cheek. Powders to be continued.

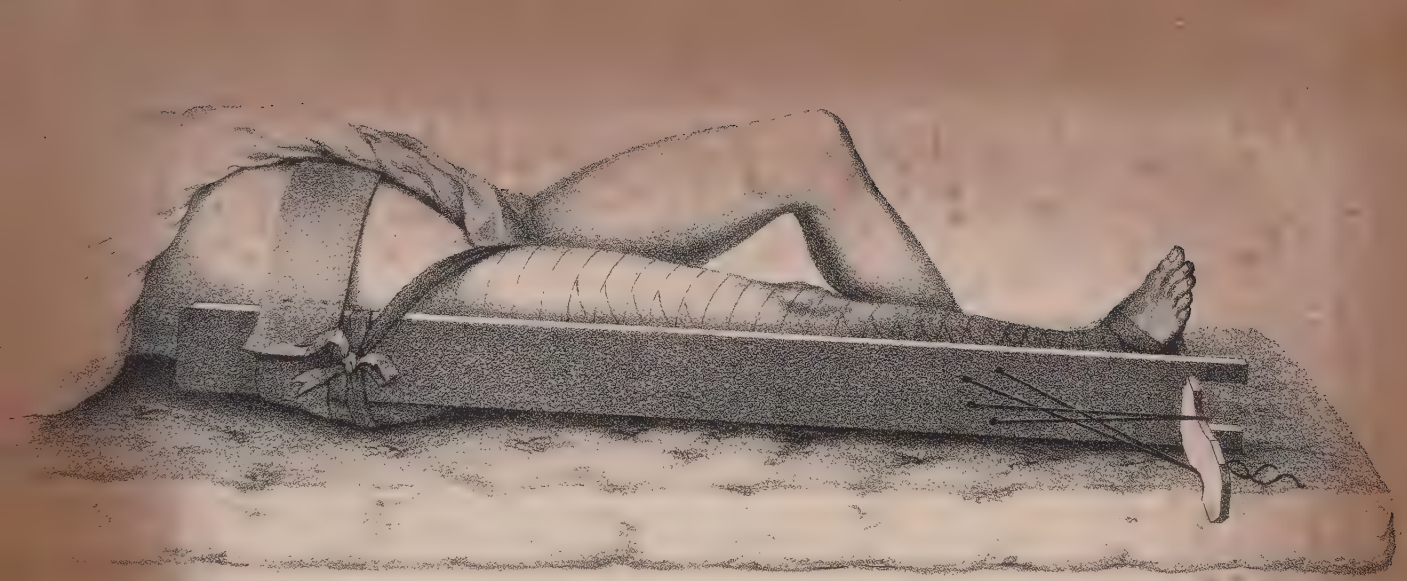
31st. Pulse 132, very weak; has just got some wine; looks much better. Bowels moved once during the night; evacuation dark-coloured. Slept uneasily during the night. Would not leave the poultice on during the night; moaned a good deal. A large, loose slough is hanging from the round opening on the right cheek, which is about as large as a halfpenny. Treatment to be continued.

August 1. Pulse 100, stronger; looks much better. Ulcer looking clean, and less inflamed. Slept a little. Bowels not moved since yesterday. Treatment continued.

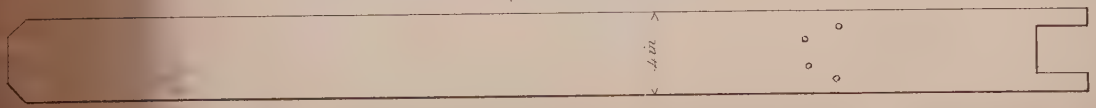
2nd. Pulse 108; rested pretty well; looks greatly improved; says he is getting better. Makes use of nothing but fluids; takes six ounces of wine in the day. Slough detached. Ulcer looks healthy; a linseed poultice to be applied to the part.

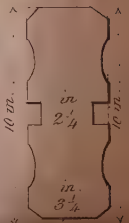
From this period the case went on favourably. The ulcer rapidly diminished in size, and is now (Aug. 20) so small that the aperture of communication with the inside of the mouth is only large enough to admit the end of a probe. The cheek has resumed very much its original appearance, but there is still a slight depression near the upper and outer part remaining. There is, I think, reason to believe that there will not be much ultimate facial deformity, though there will probably be some adhesion with the upper gum where the ulceration is not yet healed.

When I first detected the appearance of cancrum oris in this case, my former views of the disease flashed across my mind, and I felt that it would be a favourable opportunity for testing their genuineness, but I was deterred from making the attempt by a consideration of the very dangerous condition of the patient, and the fact that he had already taken a certain, though a very small proportion, of grey powder. I felt that this very small quantity, notwithstanding all my theoretical impressions to the contrary, might have been really the exciting cause of the complaint, and therefore it would have been unjustifiable, in the absence of all proof on the other side, to have renewed the use of the same mineral. My motive in first ordering these powders was to lower the vascular action about the head, and when this was accomplished, which took place after five doses had been given, they were immediately laid aside. At that period not the slightest suspicion existed of their having acted injuriously on the economy. Being deterred by the apprehensions I have mentioned from attempting anything in the way of experiment, I was shut up to the ordinary plan of treating the case by the local application of strong nitric acid, and the internal administration of wine, broth, and tonics. Though benefited at first by this treatment, he soon became worse, and his appearance was so much altered on the third day (July 24th), that I felt myself justified in seeing what effect small doses of calomel, combined with opium, would



Plan of Splint. 4 feet long





Plan of Lever

have on his condition. Notwithstanding a considerable diminution in the quantity of wine, and the almost total refusal to take any other kind of nourishment, we find that his condition improved, and the ulcerative action, though not arrested, was certainly not increased. To what is this to be referred? Was it to the opium which was combined with the calomel? Was it to a strong effort of nature, which threw off at once the incubus of the disease, and the more dangerous influence of the remedy? Whatever answer may be given to this question, it is impossible to get over the striking fact of this patient having taken four grains of calomel, in divided doses, in an advanced stage of the complaint, without any perceptible injury. Surely we might anticipate that if the disease were due to the irregular action of mercury on an unhealthy constitution, even so small an amount of the mineral (for it is the small doses that always do the mischief in these cases) ought to give us more decided evidence of its injurious effects. In fact, the gangrene ought to have immediately extended its ravages with frightful rapidity. So far, however, was this from being the case, that neither then, nor when the appearances of cancrum oris first manifested themselves, were there any of the symptoms of the ordinary action of mercury on the system. There was no ptyalism nor mercurial fetor; the gums were pale, the teeth firm in their sockets; and although the roots of some of the teeth were exposed by ulceration, yet this was not uniformly diffused over the whole set, but limited to a few on the right side of the mouth.

Art. XI.—*Description of a Lever Splint for Fractures of the Femur, with a Case illustrating its Use.* By Dillon Kelly, M. R. C. S. L., Mullingar.

Fractures through the trochanter, beneath the insertion of the rotators, being invariably productive of considerable deformity when improperly treated,—a consummation most fre-

quent in country practice where proper surgical appliances may not be always within the reach of practitioners, however competent they may be,—a splint which can be improvised under almost any circumstances, at the same time that it is equally facile of adjustment, and simple in construction, must consequently be a desideratum to those members of the profession who may unfortunately labour under such disadvantages.

Suffice it to say of its origin, that the lever splint about to be described has not been the result of deep thought or lengthened study of the particular fracture to which it has been applied; on the contrary, I took the hint of its construction (and at once acted on it) from a fortuitous yet lucky combination adopted to meet the difficulties of too coarse a bandage, and too rough materials, a state of things generally but too prevalent in country practice.

That it has fully answered the purpose for which it was intended can be at any moment proved by the living testimony of the patient; and that the original was rude, very rude indeed, in its construction is also capable of proof, the splint being formed out of the lath of a turf creel, and the lever boasting of but a similar primitive and clumsy origin.

The following is a report of the case in which I used it.

April 29th, 1850. John Gallagher, Portlemon, aged 35, two days since was drawing stones with a young horse, which, having taken fright, ran away and threw him into a deep ditch, the cart and stones falling over him; the accident having occurred in a field at some distance from his house, he remained in that position for fully three-quarters of an hour before he was discovered.

On extricating him it was found that his left leg was totally powerless, the hip and nates much swollen and ecchymosed, and any attempt at putting the leg under him, or, in fact, motion of any kind, not only impossible but productive of much agony.

A bone-setter in the neighbourhood being sent for declared all was right; but ten days elapsing and no improvement taking place, they sent for me.

On removing the bed-clothes the limb, slightly everted, was lying partly on its outer aspect, the heel resting in the fossa between the malleolus internus and tendo Achillis of the opposite leg, the trochanter depressed and thrown considerably backwards; slight fulness in the groin; crepitus, perceptible not only to the hand placed over the trochanter, but also to the bystanders when the leg was drawn downwards to its normal length, and rotated; excessive pain on abduction and rotation, but most so during the former motion; considerable deformity, and shortening to fully the extent of two inches, which disappeared on extension, but returned directly the extending force was removed. On placing him in the standing position the same eversion of the toes and shortening of the limb was still apparent, together with want of symmetry, flattening of the buttock, elevation of its fold, and slight fulness in the groin, with complete and total inability either to bear upon or even move the limb.

The diagnosis of fracture through the trochanter beneath the insertion of the rotators being made, I first applied a roller from the toes to the trochanter, for the purpose of preventing subsultus of the muscles, which was most distressing for the past three or four days.

The long splint, well padded over its trochanteric portion, was next attached to the outer aspect of the limb by the perineal band, prepared by folding diagonally a silk handkerchief padded with tow in its centre, its ends, passed from without inwards through the mortice at the top of the splint, were crossed over each other on its inner plane, then brought forwards over its edges, and tied firmly in front.

The limb was now extended to its full length, another silk handkerchief folded diagonally was fastened above the ankle with the clove hitch, the hitch posterior, its ends brought

down, one on each side of the heel, were passed over the superior concave notch of the lever, then downwards across its distal plane, next over its inferior notch, then upwards and across the metatarsus where they decussated; one end was then brought over the superior, the other over the inferior notch, and both finally tied over the distal plane of the lever.

By this arrangement of the pedal bandage the heel was partially embraced and supported by its folds as they emerged from the hitch, and thus one cause of embarrassment in the treatment, namely, the risk of gangrene of the integuments over the posterior aspect of the os calcis, in a great measure removed.

Lastly, a broad bandage was passed round the pelvis, embracing the upper end of the splint, for the purpose of keeping the trochanter in its place.

May 18th. Progressing favourably; the provisional callus apparently perfect, as there was no contraction or eversion whatever of the leg on the re-adjusting of the perineal band, which was causing considerable annoyance for the last few days.

June 5th. Splint removed, as it was productive of much pain; and the knee, which was very stiff, directed to be rubbed twice a day with camphorated oil. On the 15th he got upon crutches, and on the 4th of July was able to walk with their help to a considerable distance, complaining chiefly of the stiffness in his knee.

August 29th. He walked into the fair, a distance of nearly four miles, and says he did not feel the slightest fatigue. He has been working for the past week or ten days, but feels darting pains through the site of the fracture at times.

On making an examination a considerable degree of enlargement was perceptible to the touch, but when both legs were placed together, and his breeches on, there was not the slightest want of symmetry to be discovered,—no shortening, no eversion, no lameness, and with the exception of a slight de-

gree of weakness and uneasiness in the knee, he said he suffered no inconvenience whatever from the accident.

I shall now proceed to describe the lever splint. It consists of a long straight splint, and a pedal or lever. The splint is four inches in breadth, and must be of sufficient length to reach from midway between the anterior superior spinous process of the ileum and the nipple, to about five inches beyond the foot. It is pierced at about four inches from its pelvic extremity by a square mortice, sufficiently large to permit the ends of the perineal band to pass freely through it, and at the superior portion of its lower fourth, with four small circular holes arranged thus, ⁘, that is, two superior and two inferior, each pair on different planes, but the superior somewhat closer than the inferior; and having at its lower or pedal extremity a broad square notch, two inches in depth at the least.

The lever or pedal is ten inches long, three inches broad, and one inch and a quarter thick; it has six symmetrical notches, namely, two at its centre, small, square, and shallow, to fit into the prolonged sides of the splint, forming the boundaries of the broad notch at its pedal end, which construction allows the lever to play freely in it with a hinge-like motion; and four deep concave notches, two on each limb, over which the pedal bandage or handkerchief is tied on the one side, and the lever cords on the other.

The lever, which is of the first kind, is placed at right angles with the plane of the splint, and is adjusted by looping the centre of the lever cord over the concave notches on its outer limb, the sides of the loop decussating in their passage upwards to the holes in the splint; the extremities of the cord are then passed from without inwards through the two inferior circular holes, decussated on the inner plane of the splint, brought outwards through the two superior circular holes, and finally tied over the same notches with the loop.

The features of most importance in the construction of the lever splint are its simplicity,—as it can be prepared under

almost all circumstances, and by any, even the most unmechanical, person; the steadiness with which extension can be applied and continued for the time necessary; and finally, that the extending power acts directly downwards, and in the direction of the axis of the limb, whereas the long splint was pressed against the outer aspect of the leg and external malleolus, and the foot at the same time turned more or less outwards by the crossing of the bandage over the instep and notches.

A considerable quantity of the power requisite to keep up the necessary extension by the long splint was also expended on the internal lateral ligament of the ankle, and thus lost to the purpose for which it was intended; add to this the chafing of the external malleolus by the pressure of the splint, and there exists a combination of causes, both irritative and mechanical, calculated to militate against the proper union and adjustment of oblique fractures; all of which, however, are completely removed by this simple adaptation of the lever to the long splint of Liston.

The accompanying illustration has been taken from a plaster cast, to which I adapted a splint and lever, more symmetrical and less picturesque than the original.

Art. XII.—*On the Classification of Medicines according to their Action on the Healthy Body.* By Alexander Fleming, M.D., Professor of Materia Medica, Queen's College, Cork; and Examiner in Materia Medica, Queen's University, Ireland.

"*Une collection des faits isolés et sans liaison ne forme point une science.*"—De Candolle.

Therapeutical agents are of three kinds, surgical, hygienic, and medicinal. The present paper refers to the last only.

In the science of *Materia Medica*, treating as it does of the properties of a large number of bodies, classification is important as a help to the memory, but it has much higher purposes.

Besides furnishing useful knowledge on the action of a medicine known to us only by its place therein, a *scientific* arrangement enables us to think of and to compare together those drugs which have the greatest number of common and *practically* important properties,—assists us in detecting where our knowledge is deficient, whether in the facts or in our mode of interpreting them,—indicates the way by which the deficiencies are to be supplied,—and is eminently useful in suggesting new methods and fields of observation. Our knowledge of the operation of allied drugs is mutually corrected and explained by their being grouped together, and in thus favouring the progress of the science, a sound classification develops the means of its own rectification and improvement. Lastly, it is only the student of a scientific arrangement who can acquire the knowledge which enables him to practise on general principles, and so to avail himself with facility, on all sides, of the rapid advancement of the medical sciences.

We are surprised that many able writers on the *Materia Medica* have been indifferent to these important advantages, and that so little care has been devoted to the scientific arrangement of drugs[a]. Many of the existing classifications are unscientific and bad, and are consequently fertile sources of error, both in fact and in generalization. We allude to the so-called therapeutic arrangements, and not to those founded on the natural-historical, sensible, or chemical properties of drugs, which are not without their value in relation to certain ends, but, as commonly employed to avoid the supposed insuperable difficulties of a physiological classification, present no claim to our notice. With them we have no more concern than the natural philosopher has with the arrangement of bodies in chemistry, or the chemist with the natural arrangement of plants. The bodies examined by all are the same, but it is the duty of each science to arrange them with reference to the proper-

[a] Amongst the exceptions to this remark we must place in the first rank the distinguished authors of the "Pharmacologia," and of the "Elements of Materia Medica and Therapeutics."

ties (and their practical application, if they have such) which it is the object of the science to investigate.

Most recent authorities have sought rather to indicate the differences presented by the action of drugs when compared together than to trace the resemblances, more or less intimate, which link them into groups,—a task which, however difficult, must be performed if we hope to attain to general views and scientific treatment. To declare its performance impossible is virtually to deny the application of induction to therapeutics, and to reject its claim to the rank of science. The study of the differences of action is most instructive, but the most efficient means of making them apparent is presented by the previous arrangement of the medicines according to their physiological analogies.

It is objected that the whole range of what are termed facts in the science is so involved in controversy, doubt, and obscurity, that an attempt to arrange them systematically is useless, and has the pernicious result of giving precision and an air of truth to error. We maintain, however, that our knowledge of the physiological action of drugs—which, as will be seen in the sequel, should form the basis of a scientific arrangement—is sufficiently accurate, and embraces an ample number of undoubted truths for our purpose. Thus, the facts indicated in describing the action of a stimulant, sedative, tonic, or narcotic, are sufficiently precise to form the basis of a highly useful classification. A physiological arrangement may be pushed too far, or beyond the limits of ascertained truth; and attempts may be made to found classes and orders on phenomena still involved in obscurity. This is the abuse of a true principle, and is no argument against its proper application. The "controversy, doubt, and obscurity," complained of, exist much less in our knowledge of the physiological action of drugs than in our knowledge of the practical application of this action to the treatment of disease, where their existence does not prejudice the scientific value of an arrangement founded on the effects of medicines on the healthy body.

It is alleged that the framers of physiological arrangements have found the facts hitherto determined insufficient for their purpose, and have in consequence been obliged to resort to speculation. Hypothesis was employed, not, however, because of the insufficiency of the facts, but because of the incompetency of the *soi-disant* philosophers in this department of medicine to make a proper use of them. Therapeutics is eminently an empirical science, and every step in the discovery of truth and in the development of classification must be made by close induction. Unfortunately, several writers, as Brown, Rasori, and Broussais, thought otherwise, and, indulging in speculations independently of observation, attempted to predict facts in place of carefully generalizing those already discovered. That previous authors have made a bad use of the facts of the science should be to us a strong reason for endeavouring to employ them better, and to confine ourselves rigidly to the positive.

A scientific arrangement of drugs should be founded on the principle of placing those together whose properties present the greatest number of important points of resemblance,—the relative importance of the properties being determined by their value as guides in the application of the medicines to the treatment of disease.

The properties of drugs are numerous and of very different kinds, but a little reflection enables us easily to fix their relative importance in a system of classification. The physiological, chemical, and other properties of a medicine are examined not for their own sake, but to promote the discovery and explanation of its applications in the treatment of disease. *The discovery, therefore, of the therapeutic application, which is the grand object of the science, should be the presiding principle of its classification;* and of the several kinds of properties which a drug possesses, viz., physiological, chemical, botanical, and sensible, it is beyond question, that the first are a long way

before the others in their importance in guiding and suggesting its practical application. Indeed, our object in studying the other properties is to improve and give exactitude to our knowledge of the first. *The physiological action of drugs should form, consequently, the basis of their scientific arrangement.* Yet the other properties are sometimes usefully employed to separate the minor divisions of the physiological classes, but they should only be had recourse to for this purpose when the physiological action fails to afford better elements of distinction. The chemical, botanical, and sensible properties are now enumerated in, we believe, the order of their value as contributing to the knowledge of physiological action.

We speak here of physiological action, as obtained by the exhibition of medicinal doses. When, from the quantity of the drug, life itself is endangered, the phenomena occasionally become more complex, and assume a new character; as when a stimulant (alcohol), and a tonic (quina), occasion narcotism in poisonous doses. Our science does not require that the consideration of the poisonous effects should be included in the physiological arrangement of drugs. It would give rise to complexity, and confer no advantage in therapeutic application. The practical ends of Toxicology and Materia Medica are different: poisons are arranged in groups, whose effects require similar treatment; drugs in groups, whose effects have a common application in the treatment of disease. At the same time an examination of the physiological arrangement proposed in this memoir shows the majority of the classes, as the atonics, sedatives, tetanics, narcotics, and irritants, to be as closely allied in their poisonous action as in their medicinal effects.

Having determined that the physiological action in medicinal doses shall form the basis of our arrangement, it remains to ascertain the relative value (with reference to our present subject) of the different effects on the healthy body produced by drugs. Some of these are general, some special, others local. General action is secondary to absorption, and is manifested on

the entire frame; special action, also secondary to absorption, is displayed on one system or organ[a]; while local action, preceding absorption and independent of it, is confined to the part to which the drug is applied.

The effects designated by the terms tonic, atonic, stimulant, and sedative, are examples of general action. Their manifestation is not confined to one organ or system, but is extended to the whole body. A sedative does not depress the stomach only, or the lungs, or the circulation, or the nervous system, but all of these. We grant that all are not influenced to the same extent, and that, for example, some sedatives act more powerfully on the vascular, and others more obviously on the nervous system; but the Materia Medica furnishes no example either of a drug acting as a sedative on one system, and as a stimulant on another, or of a sedative or stimulant, whose power is not displayed more or less distinctly throughout the entire frame. These, then, are illustrations of *general physiological action, on which, in virtue of its universality, the chief classes should be established.* The first, second, third, and fourth classes of my arrangement, or the tonics, atonics, stimu-

[a] The words special and specific, now used indiscriminately, might be usefully distinguished, the former being employed in the sense I have attached to it in the text to designate action on one system or organ of the healthy body; the latter, peculiar and unexplained control over disease. Thus employed, special is a physiological, and specific a therapeutic term.

It may not be superfluous to observe here, that while I maintain the scientific accuracy and importance of associating medicines into classes which correspond in action, I believe that scarcely any two produce precisely the same effects. There is resemblance, but not identity. The impressions created may differ both in their force and nature, even among those most nearly allied. This is seen unequivocally in the repeated successful substitution of one drug for another of the same class which has lost its remedial efficacy, as in the internal exhibition of stimulants, tonics, narcotics, and the local application of irritants and astringents. Were there indeed identity, we might sweepingly retrench the Materia Medica, and introduce into our art that deceptive simplicity which is accompanied by a vast curtailment of its resources. At the same time, when we have more than enough of medicines closely allied in action, a physiological arrangement helps to indicate such of the less useful as may be safely expunged.

lants, and sedatives, are founded on the general action of the drugs they contain. They admit of a greater number of common and important propositions, and their practical applications are more obvious than any other classes into which, upon different principles of arrangement, the drugs could be thrown. The term *special*, as opposed to *general*, I employ to designate the action on a particular organ or system; thus, digitalis is a general sedative, but operates specially on the circulation; opium is a general stimulant, but has a special action on the brain, suspending its functions and producing sleep; ergot of rye has a special action on the uterus; and belladonna and opium exert special effects on the iris. These are obviously of inferior value to the former, but they are important elements of distinction. As a rule, the rank of a special physiological effect in our system of classification is determined by the double consideration of the absolute importance to life of the organ or system affected, and of the value of the practical applications of the action in the treatment of disease.

Nearly all medicines have some kind of general action, and operate more or less obviously as tonics, atonics, stimulants, or sedatives, and the *Materia Medica* might be arranged under these four classes, in which orders could be established to separate the members having important special actions, as tetanics, narcotics, and evacuants. Thus chloroform might be ranked in an order of the class sedatives, having the name of sedative narcotics; opium, in an order of the class stimulants, having the name of stimulant narcotics; while strychnia, junipers, and cantharides, might take their places among stimulants; the first in an order with the name of stimulant tetanics, and the second and third in an order with the name of stimulant diuretics. An arrangement of this kind, however, is deficient in practical value, for the obvious reason, that many of our medicines are not employed therapeutically in virtue of their general, but on account of their special action, when, as in the examples given, that is of a prominent and important

nature, and undoubtedly transcends the general in the value of its practical applications. It is manifestly more useful to make the special actions of the tetanics, narcotics, parturients, evacuants, and astringents, the characteristics of new classes, and to unite together the medicines possessing them, for common consideration and comparison. On this principle are established the fifth, sixth, seventh, eighth, and ninth classes in my arrangement. In these, the general action is usefully employed to form subdivisions, as when the narcotics and evacuants are distinguished according as they are tonic, atonic, stimulant, or sedative[a].

I consider it an essential principle in a physiological classification, that the drugs be arranged separately, according to their *local* and *remote* (general and special) actions, when between these there is no correspondence or necessary connexion. Thus ammonia, tartar emetic, sulphuric acid, and the sulphate of iron, are all *local* irritants, but respectively *remote* stimulants, sedatives, astringents, and tonics. In compliance with this principle are founded the tenth and eleventh classes of my arrangement, or the irritants and emollients.

The divisions should be as nearly as possible mutually exclusive; stimulants should contain no sedatives, and *vice versâ*. The two classes referred to *are* mutually exclusive; but the same perfection is not attainable throughout a physiological arrangement (e. g. stimulants, narcotics, and evacuants), and it is not essential to its scientific character, as some erroneously suppose. The nature of the properties themselves, as well as the circumstance, that in my classification I have regard both to the properties and their practical application, renders the attainment of mutual exclusiveness in all the divisions impracticable. It is certainly desirable, but it would be wrong to secure it by the sacrifice of any practical advantage. When a medicine obtains a place in more than one class, the plan adopted in my Lectures is to give the complete description

[a] These remarks show the error in the forced simplicity of such dichotomic arrangements as the Brunonian *more* and *less*, or the Italian *for* and *against*.

under the class which recognises its most important action, and to refer the student to this account when the drug comes again under notice. This trifling inconvenience, for there is no repetition, has been needlessly exaggerated.

In my arrangement the distinctive characters are furnished by the prominent or characteristic and well-ascertained physiological effects, and are not sought for in obscure phenomena or in the *modus operandi*. Drugs rarely operate (as some authors have supposed) exclusively as vital, chemical, or mechanical agents, but combine in the total sum of their action two or all three of these elements; and besides, our knowledge generally of the modes in which physiological actions are brought about is altogether too imperfect and uncertain to allow of its safe employment in classification. I have endeavoured to give a more definite meaning to a portion of the language of therapeutic science, but have ventured to introduce only one new term, and throughout have studiously avoided changes in the established nomenclature.

I now proceed to describe the arrangement which I have adopted in compliance with the foregoing principles. I divide the *Materia Medica* into two divisions:—I. *Physiological*, embracing all drugs employed in virtue of their physiological action; and—II. *Non-physiological*, including those substances employed in the treatment of disease, but not in virtue of their action on the living body. In the latter division is placed the twelfth class, or the anthelmintics proper. The former comprises eleven classes, arranged in the order of their importance. The first, second, third, and fourth are founded on the general action of their members, and justly obtain precedence of the fifth, sixth, seventh, eighth, and ninth, which are characterized by special actions. Priority of place is given to the tonics and atonics as they influence assimilation, the most general and essential property of living beings[a]. The fifth, sixth, and se-

[a] Vegetables, like animals, have their tonics and atonics, as shown in the effects of different soils and manures.

venth classes precede the evacuants and astringents, because they operate on more important organs, and the tetanics come before the narcotics, as the cord is more essential to animal life than the brain. The irritants and emollients recognise local action only, and come last in the order of sequence. The CLASSES are divided into orders, and these again into sub-orders, when further subdivision directs attention to important physiological analogies, or useful practical applications.

TABLE OF THE CLASSES AND THEIR DEFINITIONS.

DIVISION I.—PHYSIOLOGICAL.

CLASS 1. Tonics: increase permanently the strength and weight.

„ 2. Atonics: diminish permanently the strength and weight, independently of evacuation.

„ 3. Stimulants: increase temporarily functional activity, independently of local inflammation.

„ 4. Sedatives: diminish temporarily functional activity, independently of evacuation.

} Action followed by re-action.

„ 5. Tetanics: cause spasms of the voluntary muscles.

„ 6. Narcotics: induce sleep.

„ 7. Parturients: cause contractions of the uterus.

„ 8. Evacuants: increase secretions and excretions.

„ 9. Astringents: constrict the tissues, and diminish secretions and excretions.

10. Irritants: tend to inflame the part to which they are applied.

„ 11. Emollients: lubricate and soften the part to which they are applied.

DIVISION II.—NON-PHYSIOLOGICAL.

CLASS 12. Anthelmintics: destroy worms in the alimentary canal.

In the descriptive definitions of the classes which follow I have purposely noticed such characters only as are absolutely necessary to explain and illustrate the classification. Complete histories, embracing every common proposition that can be made of the drugs, as well in relation to their botany and chemistry as to their action, uses, and exhibition, would more strongly exhibit the principle and practical value of the arrangement, but I reserve their publication for another time.

First Class.—TONICS: *increase permanently the strength and weight.* Their operation is slow, but enduring, and without re-action. They improve the digestion and the appetite, augment the strength and flesh, give colour to the cheeks, and vigour to the animal spirits. The tonicity of the fibre is augmented, as shown by the firm muscle, and tense, unyielding pulse; but it is an error to suppose that the operation of tonics is confined to an increase of this property. They enrich the blood, and promote nutrition, and might be described strictly as medicines which improve assimilation, employing this word in its comprehensive sense to include nutrition; but I have characterized them, like the other classes, by their obvious effects.

All tonics improve assimilation, but in different ways, on which is founded their separation into four orders:—I. COD-LIVER OIL; II. IRON AND ITS COMPOUNDS; III. VEGETABLE BITTER TONICS; and IV. ACID TONICS. The first and second orders act probably by furnishing in themselves materials essential to healthy nutrition. The general tonic action of cod-liver oil is undoubtedly its most important effect. The third and fourth orders operate by invigorating the digestion, so important in the process of assimilation.

All the drugs of the third order contain a bitter principle, to which in some is superadded volatile oil or resin; in others, tannin; and in others, starch or gum; and practical advantage is gained by throwing them into four sub-orders, named:—1. *Pure;* 2. *Stimulant;* 3. *Astringent;* and 4. *Emollient Bitter*

Tonics. We could dispense with one or two of these, and make room for a *sedative* bitter tonic, like the *Prunus Virginiana*, or wild-cherry, which is a desideratum in our pharmacopœia: the sedative principle of this valuable medicine is hydrocyanic acid.

Cod-liver oil and iron are connecting links between dietetical and medicinal agents, and form the natural commencement of a list of the *Materia Medica.*

Second Class.—ATONICS: *diminish permanently the strength and weight independently of evacuation.* Like tonics, their operation is slow, but enduring, and without re-action. Their general action is an exact counterpart to that of tonics. They weaken digestion and the appetite, and bring on debility, emaciation, paleness of the features, and depression of mind. The tonicity is deeply injured, as shown by the weak, flabby muscle, and soft, compressible pulse. They impoverish the blood, check nutrition, and promote absorption, and might be described as medicines which impair assimilation. In excess they are poisonous, and commonly produce death, more or less purely, by necræmia[a]. Some members of the class are powerful irritants, but we refer here only to their remote effects.

Although all atonics impair assimilation, and produce weakness and wasting, they present important differences of action, on which is founded their division into four orders: I. MERCURIALS; II. ARSENICALS; III. IODIDES; and IV. ALKALINES: which excite, respectively, the constitutional states named mercurialism, arsenicalism, iodism, and alkalism.

That the iodide of potassium is a useful remedy in the mercurial disease is not inconsistent with an arrangement which places together mercurials and iodides. Melsens has shown this effect to be chemical, and independent of physiological action. The iodide decomposes and washes out the insoluble compounds of mercury which linger in the system, and occasion the symptoms of its chronic action.

[a] Williams' Principles of Medicine, p. 464.

The atonics comprise most of the absorbents, deobstruents, resolvents, alteratives, and spanæmics of other writers. The lowered constitution of the blood, and softening with increased absorption of healthy and morbid structures, indicated by these terms, are all necessary consequences of defective assimilation, and are equally induced by insufficient food, dyspepsia, or other source of impaired nutrition. Alterative, as generally accepted, is a therapeutic term, and should not have a place in any physiological classification. This word has different meanings attached to it, and is frequently employed obscurely to conceal our ignorance of the true action of a medicine. In its most common signification of a *therapeutic effect without obvious physiological action*, it is applied incorrectly, for when atonics are exhibited, even in small doses, effects of the kind described above may be traced, and similar phenomena, but of higher intensity, are induced by larger doses. The use of the word alterative might be advantageously discontinued.

Third Class. — Stimulants: *increase temporarily functional activity, independently of local inflammation, and their action is followed by re-action.* Stimulants heighten the temperature, increase the force and frequency of the circulation, and excite the muscular and nervous systems. This exaltation of the functions is essentially transient, and after a time these gradually subside to their normal level, and finally sink beneath it, when a state of depression or re-action is established, corresponding in degree to the previous excitement, and characterized by chilliness of the surface, languid circulation, and exhaustion of the physical and mental powers. The transient nature of their operation, and the supervention of re-action, constitute important distinctions between stimulants and tonics. The latter give strength, while the former excite functional display, which, as in over-action from other causes, is followed by exhaustion[a].

The tonic may be said to act like the addition of acid to

[a] Paris and Billing recognise this distinction.

the water of a galvanic battery, giving true increase of power; and the stimulant, like the discharging-rod, which occasions its display; the functional exaltation in the one case, and the spark in the other, being followed by temporary diminution of action, soon, however, to be restored by the continued development and accumulation of the vital and galvanic forces. As medicines, tonics and atonics commonly act on diseases directly, influencing the organization of the frame and of morbid structures; while stimulants and sedatives are more frequently exhibited to meet their symptoms and avert the tendency to extinction or excess of function.

The substances comprised in the classes of tonics and stimulants are rarely the source of poisonous effects, and when these occur, they arise from new actions, differing in kind, and not in degree only, from their operation as medicines. Thus the tonic mineral acids are irritant, and the tonic quina and the stimulant alcohol are narcotic in poisonous doses.

Stimulants are arranged in five orders, according as their active principle is alcohol, ether, ammonia, volatile oil, or resin, and to these is added a sixth, including the animal excretions, whose constitution is complex. They are named:—I. ALCOHOLIC; II. ETHEREAL; III. AMMONIACAL; IV. MYROLIC; V. RESINOUS; and VI. ANIMAL EXCRETIONS. In a physiological sense these orders are eminently natural, and have besides many common botanical, chemical, and therapeutical properties.

Fourth Class.—SEDATIVES: *diminish temporarily functional activity, independently of evacuation, and their action is followed by re-action.* The medicines of this class lower the temperature and depress directly the circulating, nervous, and muscular systems. Their action is thus an exact counterpart to that of stimulants. The dulness and inaptitude for mental exertion, induced by their moderate operation, is sometimes accompanied by a disposition to sleep; but this is very different from the true hypnotic power of the narcotics. Like stimulants, their operation is transient, and is followed by a period

of functional excitement, corresponding in degree to the previous sedation. Of this re-action we have common examples in the secondary effects of cold and blood-letting, and a similar tendency to febrile excitement has been observed after the depression of medicinal sedatives, as digitalis and aconite. They are poisonous in large doses, and commonly prove fatal by failure of the circulation or by paralysis. The extreme vital depression, or deadly faintness of sedatives, must not be confounded with the coma of a narcotic. Their temporary operation, and the supervention of re-action, with many other characters, distinguish them from atonics.

Some sedatives, as digitalis, are exhibited as drugs, more especially on account of their depressing action on the circulation; others, as belladonna and Prussic acid, on account of their soothing influence on the nervous system; while a third group, as tobacco and lobelia, are most frequently employed to weaken the muscles. Each acts upon all the systems, but may depress one more powerfully than the others, and these varieties of therapeutic application are dependent upon special differences in the physiological action of sedatives. At the same time these practical distinctions are obviously to some extent accidental, and cannot safely determine the subdivision of sedatives.

In reference to their action in medicinal doses, they are most usefully arranged in four orders, named: I. PURE; II. IRRITANT; III. ATONIC AND IRRITANT; and IV. MYDRACEOUS SEDATIVES. The third order combine with their sedative power an atonic action on the blood and system, and the characteristic phenomenon of the fourth order, the members of which are closely allied in all their effects, is dilatation of the pupil. Belladonna, stramonium, and hyoscyamus, cannot strictly be called narcotics, when that word is employed in the sense attached to it in this paper.

I regard the refrigerant effect of nitre simply as a part of its atonic sedative action. The other direct refrigerants of

writers on therapeutics are cooling lotions and refreshing drinks, the most efficient and the safest agent for both purposes being cold or iced water. The indirect refrigerants are purgatives and diaphoretics.

Fifth Class.—TETANICS: *cause spasms of the voluntary muscles.* Their action, commencing with rigidity and muscular twitches of the extremities, gradually involves all the voluntary muscles, and terminates in tetanic convulsions and death by spasmodic asphyxia. These phenomena result from a special and primary influence on the cord. Nux vomica augments the general sensibility, but leaves the intellect unimpaired, and has no decided primary effect on the circulation. This is the only tetanic drug in the Dublin Pharmacopœia.

The *Sixth Class induce sleep.* Commencing with lethargy, narcotic[a] action gradually suspends sensibility and consciousness, and in excess terminates in death by coma. It is a special and primary influence on the brain, and has no essential dependence on general stimulant action on the one hand, or general sedative action on the other. This is obvious from the fact that the narcotic power is associated with both of these actions. Some narcotics, as alcohol and ether, are general stimulants; some, as chloroform and lactucarium, are general sedatives; while others, as hops and Indian hemp, act so feebly either as stimulants or sedatives, that difference of opinion exists as to the nature of their operation in this respect. The theory which refers narcotic action to the exhaustion resulting from previous stimulation is untenable on other grounds. Were it true, all stimulants should be also narcotics, but many are not, as the ammoniacal, myrolic, and resinous. The operation of alcohol itself affords no support to this view, as in intoxication consciousness is suspended long before the secondary stage of depression, as indicated by the pulse, is established.

[a] Toxicologists (with the exception of Copland) and therapeutists commonly attach a wider signification to this word, and include under it all bodies operating on the nervous system.

Lastly, were narcotism a symptom merely of nervous exhaustion, we should expect its development in a high degree from certain sedatives, as hydrocyanic acid, conium, and aconite, which powerfully depress the cerebro-spinal system. But the slight disposition to sleep sometimes induced by these drugs cannot be likened to true narcotic action.

A separate class is made of narcotics:—1st, because of the high physiological value of their characteristic effect, and its independence of any general action; and 2nd, because they derive from it all their most important practical applications. As formerly stated, similar reasons have determined the formation into classes of the tetanics, parturients, astringents, and evacuants. The narcotics are few in number. I have not placed alcohol and ether in the list, as these are employed medicinally in virtue only of their stimulant power. Chloroform is the most energetic, and stands alone; opium and lactucarium are allied in action; while Indian hemp and hops are derived from the same natural order, and agree in the important points of not injuring the appetite or causing constipation.

Seventh Class.—Parturients: *cause contractions of the uterus.* This is a special and direct influence on the uterine contractile tissue, and has no ascertained relation to the general action of parturient drugs. The drastic cathartics induce contractions of the womb indirectly by contiguous sympathy. Ergot of rye is the only certain member of the class, but the parturient power is ascribed also to Indian hemp[a] and borax.

Eighth Class.—Evacuants: *increase the secretions and excretions.* Their influence is directed to one or more of several organs, as the stomach, bowels, kidneys, skin, lungs, and uterus; whence their division into six orders:—emetics, cathartics, diuretics, diaphoretics, expectorants, and emmenagogues[b]. Their action appears, for the most part, to be

[a] Dr. A. Christison, in Monthly Journal for August, 1851.

[b] Applied to the Schneiderian and buccal mucous membranes, irritant bodies

essentially of an irritant nature. In the case of many of the emetics and cathartics, the irritation is applied directly to the gastric and intestinal mucous membranes; in the other orders the drug is absorbed and eliminated from the blood chiefly by the organ whose secretion it augments, and whose secreting surface it irritates. This remote irritation of a secreting organ or surface is commonly, but erroneously, confounded with general stimulation; for although both properties may reside in the same drug as in the stimulant diuretics, diaphoretics, and expectorants, the former may co-exist also with general tonic, atonic, or sedative action, as in the other medicines of these orders. The irritation, whether local or remote, induces by reflex action an augmented flow of blood to the organ or membrane, and increased secretion, that being a salutary effort of nature to dilute the acrimony of the drug, and protect the living tissue. The flow of tears from snuff in the eye, and of intestinal mucus from an acrid resin in the bowels, are familiar examples of this action; and the same law determines the increase of bile from calomel in the duodenum, and diuresis from cantharis and turpentine, as they escape from the kidney.

Besides their property as evacuants, the medicines of this class possess general actions as tonics, atonics, stimulants, or sedatives, which influence powerfully their special operation, and guide, in an important manner, their application to disease. Hence their general actions are employed as elements of distinction in the subdivision of the orders.

First Order of Evacuants,—Emetics: *excite vomiting.* They irritate directly the gastric mucous membrane, and induce by reflex action increase of its secretion, and finally, inverted muscular action of the stomach, and expulsion of its contents. Some operate within five, others not for fifteen minutes or half-an

increase the pituitary and salivary secretions, and are commonly recognised as orders of evacuants; but the drugs formerly employed as errhines and sialagogues are now scarcely ever used, and have been omitted from the present edition of the Dublin Pharmacopœia.

hour; and this difference in the time required to produce emesis is associated with important distinctions in the physiological action and therapeutic applications of emetic drugs, which I have therefore divided into the *quick* and *slow*. The sulphates of zinc and copper are examples of the quick; tartar emetic and ipecacuan of the slow emetics. Their usual division into the direct and indirect is founded on an unproved theory of their mode of operation. The latter term is applied to tartar emetic and ipecacuan, which are supposed to act on the stomach remotely, or after absorption. Their tardy action is thought to indicate their solution in the stomach and passage into the blood; but it is due as probably to their acquiring acridity only in virtue of chemical changes brought about by their contact for some time with the gastric juice. On the skin their irritant influence is likewise slow of development, and is obviously secondary to some chemical re-action between the drug and the cutaneous secretions. It is also advanced in favour of their indirect operation, that vomiting is produced by their immediate introduction into the circulation; but every experimenter knows that most substances, capable of exciting sufficient disturbance, produce both vomiting and catharsis when thrown into the vessels.

Second Order of Evacuants,—Cathartics: *increase the intestinal evacuations.* Several differences are observed in this order. While the majority act uniformly on the entire extent of the canal, some influence especially the duodenum, and others the rectum; some operate speedily, others slowly. One section acts more by increase of the peristaltic movements, and another by augmenting the secretions. But the most material difference relates to their degree of activity: some operating mildly, and others energetically. On this last distinction is founded, if not the most scientific, certainly the most useful arrangement of cathartics into three sub-orders, distinguished as—Laxatives, Purgatives, and Drastics. *Laxatives* gently irritate the mucous membrane, and quicken the intestinal movements,

without increasing materially the secretions. *Purgatives* display more power, augmenting in a higher degree the peristaltic action, and exciting copious exhalation from the mucous surface. *Drastics* operate with most energy, causing severe tormina, with frequent watery evacuations; and in large doses proving fatal as irritant poisons. The *Purgatives* are arranged in three groups,—saline, mercurial, and vegetable; the saline ranking immediately after the laxatives by reason of their mild operation. The first and second of these groups offer for common consideration many points of resemblance in action and uses.

Third Order of Evacuants,—DIURETICS: *increase the urine.* Some augment the fluid portion only; others both the solid and fluid contents of the secretion, and increase it as well in specific gravity as in quantity. Nearly all the diuretics are local irritants, and, when taken into the blood, are eliminated chiefly by the kidneys and irritate the inner surface of the uriniferous canals, ureter, and bladder. This irritation induces, by reflex action, an augmented flow of blood to the kidney, and diuresis. Thus diuretics are special irritants of the urinary mucous membrane; but they have also general actions which influence powerfully their diuretic operation, and determine their division into four sub-orders, named Tonic, Atonic, Stimulant, and Sedative Diuretics. The members of the first sub-order are chalybeates, or contain a tonic bitter principle. Those of the second operate on the system as atonics; by impairing assimilation, and increasing interstitial absorption, they charge the blood with a large amount of nitrogenous excrementitious matter, which, escaping by its proper emunctory, the kidney, augments the solid constituents of the urine. The watery element is also increased, but not in the same proportion, and the specific gravity of the urine is consequently raised. The merit of having pointed out the peculiar operation of these diuretics is due to Dr. G. Bird, who named them "depurant." They all belong to the general class of atonics, and their effect on the

urine results chiefly from their action on the system; at the same time, like the other diuretics, they are eliminated by the kidneys, but their special action is weak; and it is well known that their full effect as diuretics is best obtained by uniting them with members of the other sub-orders, as in the combinations of mercury with squill or digitalis, and of the acetate of potash with juniper or broom. The general stimulant action of the third sub-order does not influence in any important degree their diuretic effect, except in debility and other morbid conditions. The sedative diuretics act undoubtedly as special irritants of the kidneys, but their general operation contributes to increase the secretion of urine when checked by undue excitement and tension of the renal vessels, and also by the more active absorption which accompanies a relaxed state of the vascular system.

Fourth Order of Evacuants,—Diaphoretics: *increase the perspiration.* This may be deficient either from undue excitement and tension, or from the opposite condition of undue debility and relaxation of the capillaries of the skin; and observation proves that diaphoresis is brought about at one time by augmenting, and at another by diminishing the activity of the cutaneous circulation. Hence the useful division of this order into Stimulant and Sedative Diaphoretics. Some of these medicines are eliminated by the skin, and exert upon it a special irritant action; but compared with the general operation of the drugs, this is of subordinate importance in inducing diaphoresis. I have added to the list of diaphoretics—quassia, sassafras, mezereon, sarsaparilla, and dulcamara,—medicines whose action, though obscure, has certainly a close relation to the skin, and is often accompanied by increase of its secretion.

Fifth Order of Evacuants,—Expectorants: *promote the secretion and expulsion of bronchial mucus.* Some are inhaled, and operate as direct irritants; others are taken into the blood, and eliminated by the lungs, increasing the mucus by remote irritation of the secreting membrane. The more important act in

another capacity, or as nauseants and emetics, and excite the pulmonary ramifications of the eighth pair through its gastric branches. Their employment renders the sputum more fluid, and promotes its discharge in accordance with the double function of the pneumogastric of presiding over both the secretion and muscular contractions of the bronchi[a]. When vomiting is induced, the bronchial contents are shaken and dislodged by the succussion of the chest. I have placed in the list of expectorants those medicines only which act as such in a physiological sense, and have arranged them in three sub-orders:—1. Stimulant; 2. Nauseant-sedative; and 3. Direct Irritant. The bronchial secretion is deficient in various morbid conditions of the pulmonary organs, and is restored on their removal by appropriate remedies, which may be atonics, sedatives, or counter-irritants; but the freer expectoration is then a therapeutic effect: nor should the true expectorants be confounded with the astringents and emollients frequently employed in affections of the lungs.

Sixth Order of Evacuants,—Emmenagogues: *promote the menstrual discharge.* Savin and ergot are believed to have a special action on the uterine secretion; but many deny the emmenagogue property of the latter. The cathartic emmenagogues excite the womb sympathetically, while various agents restore the menstrual flow therapeutically, by remedying the constitutional state with which its suppression is connected.

Ninth Class.—Astringents: *constrict the tissues, and diminish secretions and excretions.* The medicines of this class determine, primarily, contraction of the living fibre, and especially of the capillaries, to which they are applied, or through which they pass, so as to condense and pale the surface, check exudation, and arrest hemorrhage if present. These effects are promoted in many, if not all, by their tendency to form insoluble combinations with the tissues and organic fluids. Their operation is most obvious on the part to which they are ap-

[a] Dr. W. T. Gairdner in Monthly Journal, 1852.

plied; but some act through the circulation on remote organs and surfaces. The astringent power is the result of a *special* influence on the contractile fibre, and may be associated in the drugs possessing it with various general actions. Some astringents are tonic, some atonic, and others sedative, to the system. In a concentrated form many are topical irritants.

Astringent and tonic actions, though frequently united in the same drug, and co-operating in disease, are different in their nature. Among chalybeates the most active tonics have least astringency. In vegetables, the tonic property is in proportion to the amount of bitter principle, and the astringent to the amount of tannin; and the tonic power is strongest when, as in quina, the bitter principle is entirely free from tannin, the continued exhibition of which does not increase the strength and flesh, but brings on dyspepsia and constipation. It is true, that by checking asthenic fluxes and hemorrhages, astringents improve nutrition and muscular power, and, applied topically, they give contractile vigour to vessels weakened and distended by chronic inflammation; but these are therapeutic results, and should not be confounded with true tonic action.

For practical ends, this class is most usefully divided into three:—I. TANNIN-CONTAINING; II. ACID; and III. METALLIC ASTRINGENTS. The operation of the first order is slowly induced, but more enduring than that of the third, in which it is obtained more quickly, and is less persistent. The acids display remote astringent effects more distinctly than the other orders. Of the metallic astringents we know that chalybeates are tonic, and the compounds of lead, atonic and sedative to the general system; but we want precise knowledge of the friendly or unfriendly, tonic or atonic action, on assimilation, of the preparations of zinc, copper, bismuth, and silver. Tonic properties are commonly ascribed to them on account of their successful employment in epilepsy, chorea, and certain periodic disorders. They were more used formerly than at present, and in the older authors improved appetite and increase of strength are

frequently stated as results of their continued exhibition in small doses; but these effects were in many cases obviously the indirect consequences of the removal of disease; and, on the other hand, cases are recorded more recently in which the oxide of zinc brought on weakness and emaciation. The curative power in periodic complaints is common to several classes of medicines, and cannot be accepted as proof of tonic action. Matico is a doubtful astringent; it contains no tannin, and produces no constriction in the mouth. Like copaiba, cubebs, and turpentine, it is a general stimulant and special irritant of the mucous surfaces, the morbid discharges of which it checks by restoring the inflamed membrane to a state of health.

Tenth Class.—IRRITANTS: *tend to inflame the part to which they are applied.* The effect produced varies according to the energy of the drug from simple increase of secretion,—as in lachrymation from dust in the eye,—to congestion and redness, vesication, suppuration, and the formation of an eschar, or complete death of the part. These actions differ chiefly in degree, and the same means, variously applied, will produce all of them. Thus heat, turpentine, and cantharides, according to the method of their employment, excite either redness, vesication, suppuration, or sloughing; and the same irritant which in one man vesicates, in another and more susceptible subject, or in a child, may occasion pustular inflammation, or even gangrene. But though resembling each other, irritants are not identical in action. The effects of turpentine, cantharides, iodine, and arsenic, may be distinguished from analogous actions induced by mustard, ammonia, nitrate of silver, and chloride of zinc. The characteristic features of each are probably due to differences in the influence (whether mechanical or chemical) on the tissue which originates the inflammation,—that being simply an effort of nature to protect the living structure.

The subdivision of irritants, according to the intensity of their action, into RUBEFACIENTS, VESICANTS, PUSTULANTS, and CAUTERANTS, is the most convenient in practice, although some-

what artificial. The cauterants are commonly described as *local remedies, acting chemically;* but this definition applies only to their use in the removal of a wart or malignant growth, and not to their employment to form an issue, or alter the action of an ulcer, in which cases they owe their therapeutic value not to the primary, chemical, and destructive agency, but to the vital effects which follow, and which are as much a part of the operation of a cauterant as the redness of a sinapism, or the vesication of cantharides. The common division of irritants into vital and chemical is founded on a gratuitous assumption of a difference in their mode of operation.

The irritants are mutually exclusive of the emollients, but they have various remote actions,—there being, as previously stated, no necessary correspondence between the local and remote effects of medicines. The terms irritant and stimulant are sometimes used indiscriminately, but correctly employed, their meanings differ widely, and should be carefully distinguished.

Eleventh Class.—Emollients: *lubricate and soften the part to which they are applied,* diminishing its physical cohesion and elasticity, and its vital tonicity. They relax the surface, shield it from irritation, and sooth it when inflamed. Their action is strictly local, and is obtained only on the skin and such of the mucous membranes as are within reach of topical medication. They are not conveyed by the circulation to distant parts so as to act upon them in the capacity of emollients; almost all are nutritious, and undergo digestion in the stomach, —a result incompatible with their alleged remote action through the blood. As therapeutic agents, they are believed to influence neighbouring parts sympathetically: thus, in bronchial affections, the softening effect of their application to the top of the larynx is said to extend downwards along the trachea and bronchi; and their soothing action on the alimentary canal is believed to induce a like influence on the kidneys and bladder in renal irritation and vesical catarrh,—an effect chiefly due,

however, to the water, taken at the same time, diluting the acrimony of the urine. The poultice and vapour douche are the most efficient means of producing emollient action. The medicinal members of the class divide themselves naturally into five orders:—MUCILAGINOUS, AMYLACEOUS, SACCHARINE, OILY AND WAXY, AND ALBUMINOUS EMOLLIENTS.

Twelfth Class.—The non-physiological division contains one class,—the ANTHELMINTICS,—comprising those medicines which *destroy worms in the alimentary canal.* They are brought into immediate contact with the worms, and either poison them, or detach them mechanically from the mucous membrane,—operating external to, and independently of, the vital forces. Thus understood, the class represents the vermicides proper, and does not include the cathartic vermifuges, or the tonics which check indirectly the generation of worms by restoring the healthy state of the digestive tube. The Dublin Pharmacopœia has a poor catalogue of true anthelmintics, and omits the male shield-fern, and other drugs of good repute in the treatment of worms.

Our classification relates exclusively to medicines or the drugs employed in the treatment of disease. Besides these, the Pharmacopœias contain certain articles used either as hygienic agents—as the disinfectants and deodorizers,—or as pharmaceutical agents—as the tests, perfumes, and colour-giving drugs,—the consideration of which belongs, not to medicinal therapeutics, but respectively to hygiene and pharmacy.

The introduction of therapeutical classes was unnecessary as well as incompatible with the principle and object of a physiological arrangement. The physiological action of a medicine, or its operation on the healthy body, is expressed by the names of the classes in the foregoing classification; and the therapeutical action, or its curative power in disease, by the terms—anodyne, antacid, antilithic, antiphlogistic, antispasmodic, &c. While the former is constant, both in health and disease, the latter is uncertain and relative; yet many believe

the arrangement of drugs according to their effects in disease to be the most useful in practice. But such an arrangement is, for *practical* ends, most dangerous, as tending to indicate anodynes in all cases of pain, antiphlogistics in all cases of inflammation, and antispasmodics in all cases of spasm; whereas these diseases acknowledge various causes, and occur under such different circumstances as to age, constitution, and period of complaint, as to demand dissimilar and often opposite modes of treatment. Every step in pathology impresses more strongly the absolute necessity of treating disease on general principles, and of abandoning the empirical folly—fostered by a therapeutical classification—of providing a catalogue of remedies against another catalogue of names of disease. On the other hand, such a system does not respond to a single *scientific* requirement; the only common proposition that can be made of the anodynes, antiphlogistics, or antispasmodics, is, that they are useful in pain, inflammation, or spasm, and that even, as just observed, is open to exception. These classes include medicines having very different effects on the healthy frame. Anodynes are found among sedatives and narcotics; antiphlogistics among tonics, atonics, sedatives, narcotics, evacuants, astringents, irritants, and emollients; antispasmodics among tonics, stimulants, sedatives, and narcotics. Thus employed, as a fundamental element in the classification of medicines, the therapeutical character is bad both in principle and practice; but it is, nevertheless, of service to give the student of the Materia Medica a general view of the therapeutical classes, and compare the respective value, special applications, and contra-indications of their members in the diseases of which they are curative.

In describing the action and uses of medicines, the employment of physiological terms in a therapeutic sense, and *vice versâ*, is a common source of confusion, and should be avoided.

The following list of medicines is arranged according to

the classification proposed in the preceding pages. In preparing it I have confined myself to the medicines officinal in the Dublin Pharmacopœia, and have sought rather to reduce than to multiply the members of the classes and orders, believing that the list would thus be made most useful.

Class I.—Tonics.

Order I.—cod-liver oil.

Order II.—iron and its compounds.

Order III.—vegetable bitter tonics. *Pure*—quassia and simaruba; gentian and chiretta. *Stimulant*—anthemis and taraxacum; cascarilla. *Astringent*—cinchona. *Emollient*—calumba and pareira; cetraria.

Order IV.—acid tonics. Sulphuric, nitric, and muriatic acids; lemon-juice.

Class II.—Atonics.

Order I.—mercurials. The metal and its mechanical forms; calomel and corrosive sublimate; green and red iodides.

Order II.—arsenicals. Arsenious acid and liquor arsenicalis.

Order III.—iodides. Iodine and iodide of potassium.

Order IV.—alkalines. Potassa, its carbonate, bicarbonate, nitrate, and chlorate; carbonate, bicarbonate, and borate of soda; lime and its carbonate; magnesia and its carbonate.

Class III.—Stimulants.

Order I.—alcoholic. Spirits, wines, and malt liquors.

Order II.—ethereal. Sulphuric ether, spiritus æthereus oleosus and spiritus æthereus nitrosus.

Order III.—ammoniacal. Liquor, aromatic and fetid spirits; sesquicarbonate, bicarbonate, acetate, and muriate of ammonia.

Order iv.—myrolic. From the *Labiatæ*—peppermint, spearmint, and pennyroyal; lavender and rosemary. *Umbelliferæ*—anise, coriander, caraway, and fennel. *Myrtaceæ*—cajeput, cloves, and pimento. *Myristicaceæ*—nutmeg. *Lauraceæ*—cinnamon, camphor. *Coniferæ*—oil of turpentine. *Valerianaceæ*—valerian. *Meliaceæ*—canella. *Zingiberaceæ*—ginger, cardamoms. *Aristolochiaceæ*, serpentaria.

Order v.—resinous. *Oleo-resins*—copaiba, cubebs, matico; black and cayenne peppers. *Gum-resins*—assafœtida, ammoniac, galbanum, myrrh.

Order vi.—animal excretions. Musk and castor.

Class IV.—Sedatives.

Order i.—pure. Digitalis; aconite; conium; hydrocyanic acid and cherry laurel; pyroxylic spirit.

Order ii.—atonic and irritant. Tartar emetic; nitrate of potassa.

Order iii.—irritant. Tobacco and lobelia; colchicum.

Order iv.—mydraceous. Belladonna, stramonium, and hyoscyamus.

Class V.—Tetanics.

Nux vomica.

Class VI.—Narcotics.

Chloroform; opium and lactucarium; Indian hemp and hops.

Class VII.—Parturients.

Ergot of rye; Indian hemp; borax.

Class VIII.—Evacuants.

Order i.—Emetics. *Quick*—sulphates of zinc and copper; salt; mustard. *Slow*—tartar emetic; ipecacuan.

Order II.—Cathartics. (A) *Laxatives*—sulphur; magnesia and its carbonate; manna; tamarinds; prunes; olive oil; honey. (B) *Purgatives. Saline*—sulphate of magnesia; sulphate and phosphate of soda; tartrate of potassa and soda; sulphate, bisulphate, tartrate, and bitartrate of potassa. *Mercurial*—calomel; mercurial pill; mercury with chalk; mercury with magnesia. *Vegetable*—castor oil; senna; rhubarb; aloes; turpentine. (C) *Drastics*—jalap; scammony; colocynth and elaterium; gamboge; croton oil.

Order III.—Diuretics. *Tonic*—muriate of iron; pareira; pyrola; taraxacum; broom. *Atonic*—mercurials; acetate, bitartrate, and nitrate of potassa; acetate of soda. *Stimulant*—spirit of nitric ether; turpentine; juniper; bucku; and cantharis. *Sedative*—digitalis; squill; colchicum; tobacco.

Order IV.—diaphoretics. *Stimulant*—acetate of ammonia; guaiacum, sassafras, and mezereon. *Sedative*—antimonials; opium and ipecacuan; sarsaparilla and dulcamara.

Order V.—Expectorants. *Stimulant*—balsam of Tolu; benzoin and its acid; senega. *Nauseant-Sedative*—tartar emetic; ipecacuan; squill. *Direct Irritant*—chlorine; iodine; tar; vinegar.

Order VI.—Emmenagogues. Savin; myrrh(?); ergot(?); aloes, and other cathartics.

Class IX.—Astringents.

Order I.—tannin-containing astringents. Tannin; catechu; kino; krameria; galls; oak-bark; logwood; uva-ursi; and French roses.

Order II.—acid astringents. Sulphuric, acetic, and gallic acids.

Order III.—metallic astringents. Astringent preparations of iron (tonic); lead (atonic and sedative); zinc; bismuth; copper; silver; lime; alum; opium(?); matico(?).

Class X.—Irritants.

Order I.—rubefacients. *Mild*—Tar; resin; Burgundy pitch; elemi; creasote; ammoniac; camphor; oil of amber; iodine; yeast; the alkalies, their carbonates and chlorides; sulphur and its iodide; liver of sulphur; iodide, nitrate, and ammonio-chloride of mercury, &c.: nearly all the drugs applied in the form of ointment, plaster, liniment, and wash, and which are neither astringent, sedative, emollient, nor strongly acrid, may be arranged under this head. *Strong*—cantharis; ammonia; mustard; turpentine; cayenne.

Order II.—vesicants. Cantharis; ammonia; nitrate of silver.

Order III.—pustulants. Tartar emetic; croton oil; ipecacuan.

Order IV.—cauterants. *Mild*—acetic acid; nitrate of silver; subacetate of copper; red oxide of mercury; savin. *Strong*—nitric and sulphuric acids; arsenious acid; potassa; lime; chloride of zinc; terchloride of antimony; pernitrate of mercury.

Class XI.—Emollients.

Order I.—mucilaginous. Gum Arabic; tragacanth; hemidesmus (mucilage and oil); linseed; sweet almonds.

Order II.—amylaceous. Wheat, starch, and flour; oatmeal; barley; carrot; Iceland moss; arrowroot, tous les mois, sago, tapioca.

Order iii.—saccharine. Sugar, treacle, liquorice, figs, raisins; glycerine.

Order iv.—oily and waxy. Lard, spermaceti, wax; oils of olive, almond, and linseed.

Order v.—albuminous. Egg.

Class XII.—Anthelmintics.

Pomegranate; oil of turpentine; quassia; cowhage; tin powder; male fern; kousso.

No classification of medicines can pretend to freedom from errors and defects, which are unavoidable in the present imperfect state of the science of therapeutics. I hope simply to have founded the foregoing on true principles, of which a good proof will be, its capability of assuming, without violence to its fabric, such corrections as are rendered necessary by the progress of knowledge.

Art. XIII. — *Observations on permanently Slow Pulse and Fatty Degeneration of the Heart.* By Ben. Wills Richardson, Fellow and Licentiate of the Royal College of Surgeons in Ireland.

In the latter part of the last century Dr. Heberden published two cases of slowness of the pulse, in one of which he tells us, the chief distemper was the age of fourscore, in whom for the last two years of his life he only counted so many as 42 pulsations, but they were seldom above 30, and sometimes not more than 26; and though he seemed heavy and torpid, yet he could go out in a carriage, and walk about his garden, receive company, and eat with a tolerable appetite. He saw another whose pulse, as he was told, was sometimes, in the beginning of his illness, not above 12 or 16 in the minute[a]. Dr. Heberden, however, did not allude to the pathology of this

[a] Medical Transactions of London College of Physicians, vol. ii. p. 29. 1772.

remarkable symptom, and this is the more peculiar when we consider that the connexion between a fatty state of the heart and slowness of the pulse was known, at least to one of his contemporaries, for we find Dr. Macbride, of Dublin, writing in the same year on this subject, and in the following words: "When we find the pulse unnaturally slow, we infer that the heart and arterial system are less irritable than they ought to be, which may happen from a want of proper supply of subtile nervous fluid to enliven the fibres, as seems to be the case when the vessels or ventricles of the brain are surcharged with blood or serum, or when it is pressed upon by the skull, beat in, or fractured. The *irritability of the heart may also be lessened, and the power of its fibres weakened, from an accumulation of oily, gelatinous, or watery fluid in the cellular interstices, as happens in the cases of over-corpulent or hydropic habits.*" Again, "the accumulation of fat about the basis of the heart and the large vessels connected therewith incumber it so that neither the systolic nor subsultory motions can be performed with sufficient freedom, *whence the weakness and slowness of the pulse*"[a].

A few years later the following case was published, in which there is strong evidence of the connexion between slowness of the pulse and a softened state of the heart, and which it is fair to assume was one of fatty degeneration of the organ, since all the flabby hearts which Dr. Quain examined were affected with this disease[b].

"Dr. James Johnstone read the history of the case of a clergyman before the Medical Society of London, in whom *the pulse was remarkably slow*, though very regular, which circumstance made him intimate to his family, considering his make and age, the propriety of precautions if anything like giddiness or pain in the head should appear to threaten apoplexy. Nothing, however, of this kind happened.

"In June of that year he complained of shortness of

[a] Macbride's Practice of Physic, p. 217. London, 1772.

[b] Medico-Chirurgical Transactions, vol. xxxiii. p. 131.

breathing, with pain in his chest and across to his arms on walking, especially if up any ascent; he had frequent returns of these symptoms in the months of June and July, notwithstanding bleeding, the administration of a brisk cathartic or two, and some other medicines. On the evening of the 2nd August same year, he seemed cheerful and well, went to bed; early the following morning his wife was roused by the noise of his expiring groan, in fact he was dead in an instant. This gentleman was in his seventy-first year.

" His body was opened on the 4th of August. The intestines were in a natural state, but much inflated with wind; stomach covered with a very black mucus, quite empty, very much discoloured, in many places black, particularly about the pylorus; the blood-vessels over it very much distended; liver indurated in every part, but mostly so about its edges; the heart very *putrid, admitting the fingers to pass through it with very little pressure*, it was quite empty, and the vessels going to and from it perfectly sound, and no ossification; kidneys very much diseased, hardened in every part, the pelvis with difficulty distinguished, it was covered very much with fat"[a].

We have here, then, an undoubted case of a softened heart in connexion with slowness of the pulse; but it is of further interest, in that we are told the vessels going to and from the heart were perfectly sound, and no ossification, which shows that slowness of the pulse may occur in such cases without aortic disease.

I have taken the next case from the Medical Commentaries, and although we are told by the writer that nothing morbid was found in the thorax, yet if we compare the symptoms with those now so well known as belonging to a softened or degenerate state of the heart, we shall see the probability of its having been a case of this disease which was overlooked. Indeed the writer himself did not consider the appearances found in the head sufficient to account for death. Under any

[a] Memoirs of the Medical Society of London, vol. i. p. 376. 1787.

circumstances, however, this case and the two succeeding are of great interest, as presenting us with such a very remarkable slowness of the pulse; they may without any apology be introduced here.

Dr. Spens was called "on the 16th of May, 1792, to see a mechanic who was in the fifty-fourth year of his age. He was surprised to find his pulse only 24 in a minute; he informed him that about three o'clock in the afternoon he had been suddenly taken ill while standing in the street, that he had fallen to the ground senseless, in which state he continued about four minutes. From the time of this first attack till he saw him he had been affected with three other fits, nearly of a similar nature; these, however, were attended with some convulsive motions of his limbs, and with screaming during the fit. When Dr. Spens saw him he was somewhat drowsy, but perfectly collected, and his voice was as strong as when he enjoyed a state of perfect health, nor had he at that time any other complaint.

"17th. He had several fits during the night, which were of longer duration and more violent; and his pulse was only 23 in the minute. At 9 in the evening he found that he had no return of the fits or of fainting since 5 A.M.; at this hour, feeling one of his fits coming on, he was given a teacupful of wine, and the uneasiness went off; his pulse continued in the same state.

18th. He fainted frequently during the night, and his pulse beat 26 in the minute.

"After Dr. Spens saw him, he got up and walked about his workshop. Finding himself well, he sat down to dinner; but on taking some broth, he almost instantly felt faint. About eight o'clock in the evening he took a bit of newly-toasted bread, and as soon as he tasted it he instantly cried out, fell back senseless, with smart convulsions of all his muscles. He apparently recovered in a few seconds; but hardly any pulse could be felt for a few moments.

"19th. The report was, that he had been very faint almost the whole night, having had frequent fits, with convulsions. He now felt, at their commencement, a violent pain in the head; but when free from the fit he was perfectly collected and distinct. The pulse was now found to be only 10 strokes in the minute, though regular and strong. He was given a glassful of whiskey, and his pulse rose again to 24. But at three o'clock in the afternoon the pulse was found by Dr. Spens to be only 9 in the minute. The patient was in great distress from constant sickness and faintness, but perfectly sensible and collected. At 7 in the evening the pulse was still 9, but much weaker. He was sensible, but unable to speak. During the whole of the following night he was observed never to have moved his right arm and leg; and he expired on the 20th at 9 in the morning.

"About two ounces of a watery fluid were found in the ventricles of the brain, and a gelatiniform appearance was observed in some parts of the pia mater. A small ossification existed on the back part of the dura mater."

We are told that nothing morbid was found in the thorax.

"This man's pulse, a couple of years before his death, when examined by his medical attendant after an illness, beat from 60 to 70."

As I mentioned before, Dr. Spens did not attribute death to the appearances found in the brain, not considering them sufficient to account for it. Now, if we consider that a large amount of serum is, even in health, found in the ventricles and membranes of the brain, as well as disseminated throughout its substance, and that this serum appears to be, as Dr. Burrowes maintains[a], "supplemental to the other contents of the cranium; at one time giving place to an increased quantity of blood; at another, making up for a deficiency of blood in the vessels of the head." And if we further take into consideration the great probability that, owing to the slowness of the pulse,

[a] Disorders of the Cerebral Circulation, pp. 50, 56.

the brain may not have received a sufficient quantity of blood to maintain the normal pressure upon the organ, the serum found in the brain, in Dr. Spens' case, may not have been in abnormal quantity.

This opinion receives additional support from that of Rokitansky, who writes: "When an empty space is formed within the skull, by a reduction of the volume of the brain, it is filled up by an increase of the volume of the inner membranes of the brain, and especially by an extraordinary exhalation of serum into the tissue of the pia mater, the sac of the arachnoid, and the internal cavities of the brain, more particularly the lateral ventricles." And again: "The great frequency of chronic effusions, and their similarity, render it one of the most difficult duties of the pathologist to recognise fatal effusions of this kind, and to determine that serous apoplexy has occurred in any particular case"[a].

"If there be much blood," say Drs. Todd and Bowman, "the surrounding fluid will be totally, or in a great measure deficient; if the brain be anæmic, the quantity of surrounding fluid will be large." And further on: "The brain may receive too little blood. In such a case, if the surrounding fluid do not increase too rapidly, the requisite degree of pressure will be maintained, and the healthy action of the brain preserved. But if the brain be deprived of its due proportion of blood by some sudden depression of the heart's power, there is no time nor source for the pouring out of new fluid, and a state of syncope or of delirium will ensue"[b]. Lastly, Dr. Burrowes states, that there may be most extensive serous effusion in the cranium, and no apoplectic symptoms at all[c].

If, then, the idea is correct, that the appearances found in the head were not sufficient to account for death, is it not

[a] Rokitansky, Pathological Anatomy, Sydenham Society's Edition, vol. iii. pp. 364 and 405.

[b] Physiological Anatomy, vol. i. p. 298.

[c] *Op. cit.*, p. 91.

probable that this was a case of fatty degeneration of the heart which was overlooked, and that the syncopal attacks, convulsions, and headach, were owing to insufficient vascular pressure on the brain; an opinion which receives support from the effect that wine and whisky had in warding off the attacks. The case also presents us with a pulse at 9 in the minute, and yet compatible for many hours with integrity of the intellectual functions.

The case I am now about to give was published some years afterwards by, I believe, the same writer, and is called by him a case of conversion of the heart.

"A lady returning from church on Sunday, the 5th November, 1815, fainted in the street. She could not be said to be in very good health, having lately had a severe illness, the principal symptoms of which were frequent and long-continued attacks of acute pain in the lower part of the belly and back, extending down the thighs, with a bloody discharge from both the rectum and vagina, and incontinence of urine. The seat and nature of this disease was obscure, but she recovered, and was so well for months as to be able to walk about, and take an active share in the management of her house and family. The only symptom previous to this syncope was a degree of dyspnœa lately felt on motion or exertion. She fainted two other times on Sunday evening, and had frequent vomiting.

"Nov. 6th. She had almost constant nausea and frequent vomiting, and a feeling of faintness and oppression, or anxiety about the breast, which was most distressing. Notwithstanding these feelings, however, the motions of expiration and inspiration were apparently going on quite regularly. Pulse 75.

"7th. Continued in the same state; but the pulse now varied from 24 to 30, regular, and not feeble; respiration apparently natural.

"8th. Was quite easy from 7 A. M till 9 P. M., but her pulse continued the same

"9th. Pulse as before; great and persistent uneasiness, but sometimes aggravated for a short time, with intermission of pulse. She complained of constant palpitation, but this could hardly, if at all, be felt by the hand. No nausea or vomiting; and she frequently took a little beaf-tea, or brandy and water, loathing every other kind of food or medicine.

"10th. Nearly in the same state as yesterday. Her bowels were kept open by laxative pills or injections.

"11th. These fits of aggravation of distress were attended with turning up of the eyes, clenching of the hands, cessation of pulse, and insensibility, continuing ten or twelve seconds; they were almost incessant from midnight to 4 A. M. She described her feelings, at the time of their accession, as those of going into a faint, and said she suffered very great uneasiness on the return of sensibility. Her pulse was felt repeatedly as low as 10 in the course of last night; but early this forenoon the palpitation became excessive and constant; the beating of the heart and carotids so rapid as hardly to be counted (I think about 200), and strong, while the pulse was scarcely to be felt at the wrist.

"12th. 10, A. M. Palpitation has been constant, and of the same rapidity, attended with very great distress, and almost constant screaming, but no more convulsive fits; no pulse at the wrist; hands somewhat swelled, and at times of a darkish colour, also cold, as well as the feet, but all at present warm; voice strong; mind entire and firm, though quite aware of her danger. Forty drops of laudanum were given, and within an hour she became quiet, and remained so the whole day, though the palpitation continued undiminished. Thirty drops of laudanum were given at 10, P. M.

"13th. Lay quiet all night. About 8 A. M., being more uneasy, thirty drops of laudanum were given. 10 A. M. Palpitation continues nearly as rapid; hands cold; feet warm; breathing quick; speaks seldom, and with difficulty; takes

some drink frequently, and the glass in her own hand. Between 7 and 8 P.M., when a drink was offered her, she said, 'Stop a little,' had a smart convulsion, and expired."

The body was inspected by Dr. Gordon. "The cavities of the chest and abdomen were examined. The lungs were healthy, both in their substance and on their surface; there was a slight effusion of a yellowish serum into each cavity of the pleura. The heart appeared a little larger than is usual in proportion to the stature of the individual; a large portion of the middle of its anterior surface was covered with a loose flocculent matter, which adhered at one or two points to the pericardium. A large portion of the muscular coat of the right ventricle was converted into a firm, whitish matter, like that which is found in scrofulous mesenteric glands. This conversion was confined to the anterior side of the ventricle, and to about an inch square of the septum, close to the orifice of the pulmonary artery. In the anterior side of the ventricle it did not extend quite to the apex, but occupied chiefly the parts next the tricuspid valve, and there the sides of the heart were thickened, in consequence, fully a quarter of an inch. The tricuspid valve, however, as well as all the fleshy columns connected with it, were in a healthy state. In the septum of the ventricles, the conversion did not penetrate to the left ventricle, but seemed to occupy only the half next the right. In consequence of the disease towards the orifice of the pulmonary artery, this opening was considerably diminished. The right auricle was a little larger than usual, and its fleshy columns were considerably thicker. The left ventricle presented a perfectly natural appearance, except in one circumstance: close to the orifice of the aorta a little sac sprung from the surface of the ventricle, and projected into its arterial orifice, lying on the inferior semilunar valve; the sac looked as if composed of fibrine, and, when perforated, a greyish, cream-looking matter issued out of it; its connexion to the surface of the ventricle was very firm. The left auricle was quite healthy, as well as

the mitral valves. The semilunar valves, both of the pulmonary artery and aorta, were in a natural state. There was about a tablespoonful of yellowish serum in the pericardium. The sides of the uterus were a little thicker than usual, but everything else in the abdomen was healthy"[a].

The symptoms in the following case, which I have taken from the Medico-Chirurgical Transactions, resemble very strongly those of a softened and degenerated heart. It is but right, however, to admit that the state of the medulla oblongata may have had some effect on the heart's action; still there can be no doubt that there was a lesion of the heart itself.

"A gentleman, aged 64, in December, 1834, whilst hunting, fell from his horse on his head, with his chin thrown violently on his sternum; he was stunned, and on recovering himself he said that he had broken his neck. He was attended by Mr. Dix, of Long Buckley, in Northamptonshire. He complained of general soreness and stiffness, and of great pain in the neck about the cuneiform process and condyles of the os occipitis; he was helpless, and could not move in bed, and was totally unable to rotate the head. He was cupped, &c., and the head supported by an air-collar. The pain in the head continued about six weeks. At the end of three months he was enabled to be removed to London, and was seen, as the writer believed, by Mr. Keate.

"Mr. Dix saw this gentleman, about a year afterwards, looking very well, and in excellent spirits, but still complaining of a difficulty in moving the head.

"There was no further particular observed in this case until January, 1837, when he had a fainting fit whilst walking out. Mr. Jackson, of Stamford, was sent for, and he found the pulse at 20 in the minute.

"In the same year, after having been at the spring races at Newmarket, and excited, and having fasted for several hours, this gentleman had a second fit.

[a] Edinburgh Medical Journal, vol xii. p. 192. 1816.

"In the following June, after a similar excitement, he had another attack. On this occasion he was attended by Dr. Mitchell, and his pulse was then 25 in the minute.

"At the time the writer first saw this gentleman, in March, 1837, his pulse, when he was free from excitement or casual disorder, was 33, but it was easily altered. Mental excitement usually increased it, and in general this was followed by a corresponding slowness of the pulse, and often by a fainting fit; and a sudden rise of the pulse, or even a gradual increase above the point, which might in his state be called the healthful standard, usually indicated mischief, and was found to be a bad symptom. Costiveness, and disorder of the stomach and bowels, always affected the pulse, by increasing or diminishing it, and were most invariably exciting causes of a fainting fit. Gout[a], to which he was very subject, was another cause of this disturbance of the circulation. The general character of the pulse, when he felt well and was free from disorder, was firm, full, and free; sometimes quite regular, sometimes intermittent.

"The attacks increased in frequency as well as in degree as time advanced, and the first most severe and alarming succession of fits occurred in June, 1838. On the previous day this gentleman had eaten heartily of a variety of substances at his dinner, and on the following day, about one o'clock, P. M., syncope came on, and a succession of fits continued till half-past six or seven in the evening, with intervals of one or two to fifteen minutes between the attacks. I gave him brandy and other stimuli, without stopping or even abating the fits; on the contrary, they seemed to increase the mischief, for they made him sick, and disordered his stomach. His pulse on this occasion sunk considerably, it chiefly ranged between 20 and 15 per minute, but at times it fell to 12, 10, 9, 8; and at three or four different times, when the patient was quite sensible, and not in

[a] Fatty degeneration of the heart plays a prominent part in the natural history of gout.

a fit, the writer counted his pulse as low as $7\frac{1}{2}$ in the minute. Dr. Mitchell on a subsequent occasion also observed this very low state of the pulse, as did Mr. Cullen, who was then acting as Mr. Holberton's assistant.

"If the finger were placed on the radial artery, the approach of a fainting fit might always be known, sometimes for a second or two before it manifested itself by any change of the countenance. The pulse would cease before the syncope took place, and the fit would continue till the heart again beat, when the face would redden and consciousness return with a wild stare, and occasionally a snorting, a slight foaming at the mouth, and a convulsive action of the muscles of the mouth and face.

"The frequency of the attacks was uncertain, sometimes one in a week, sometimes one in a fortnight, or three or four weeks. Sometimes the fit would be severe and all consciousness be lost, at other times there would be a mere threatening or giddiness. Stimulants, nervous and antispasmodic medicines, were had recourse to, for the purpose of warding off the attacks, but without any marked advantage, and the treatment that was found at length to be the best, consisted in carefully regulating the bowels, preventing the formation of acid in the stomach, giving plain nutritious diet, with three or four glasses of wine a day, or a proportionate quantity of brandy and water."

"As before stated, the frequent exhibition of stimulants not having the desired effect of stopping the attacks, but rather being productive of injury, by exciting the system and disordering the stomach, the treatment that Dr. Mitchell and Mr. Holberton found to be the best, during a fit, was simply to fan the face, apply *eau de Cologne*, &c. to the nostrils, forehead, and temples, and, if there were a disposition to a continuance, to give coffee or tea.

"The most severe single attack this gentleman had, except the one which destroyed him, occurred at his dinner, about six months before his death. He had hastily eaten a mutton chop, and was taking a second, when he was suddenly seized, and

was, to all appearance, for a few seconds dead. His last attack, in April, 1840, occurred also at his dinner, and was attended with no convulsive movement or other symptom, either in character or degree, that had not been noticed in the previous fits; it differed only in its termination.

"The body was examined by Mr. Liston and Mr. Ancram thirty-six hours after death.

"Mr. Liston's Report. *Chest.*—Lungs healthy; *heart large; the parietes of left ventricle rather thin. The lining membrane was much thickened generally. The left auriculo-ventricular opening was rather enlarged, and admitted three fingers very easily. The valves of the aorta were healthy. The lining membrane of the right ventricle was slightly thickened in several places. The right auriculo-ventricular opening was extremely large, and admitted the points of four fingers and thumb.* The valves of the pulmonary artery were quite healthy.

"*Head.*—The dura-mater was very firmly united throughout its whole extent to the cranium, which was dense, and unusually thin. There was a large quantity of serum contained in the cavity of the arachnoid. The substance of the brain was slightly congested; it was in other respects perfectly healthy. The medulla oblongata was small in size, and extremely firm in consistence. The foramen magnum was altered in shape; the antero-posterior diameter much diminished. The superior part of the odontoid process of the axis appeared to have been pushed back, and somewhat raised above its usual situation. The antero-posterior diameter was so much narrowed that it would not admit of the little finger. The dura-mater and ligament covering the posterior part of the body of the axis were very much thickened. The atlas was in its usual situation, but the articular cavities were firmly ossified to the condyles of the occipital bone, and permitted no motion whatever between the atlas and skull. There was a slight unnatural projection on the lamina on the right side, between the spinous process and articular process of the axis.

"No ossification or calcareous deposit was found in any part of the vascular system. The blood was in a fluid state. The pneumogastric nerves were large, and the middle cervical ganglion of the right side was unusually developed"[a].

Although the account of the heart is not so minute as would be required at the present time, yet it is sufficiently so to warrant the idea that it was a large, dilated, weakened, and, most probably, a degenerated organ. I have selected these cases, as the pulse was lower in them than in any others I can find recorded. The symptoms so accurately correspond with those described by Mr. Robert Adams, Drs. Stokes, Ormerod, Quain, and others, as belonging to a degenerated state of the heart, that I was induced to place them here.

Mr. Adams' cases have been so recently alluded to in Dr. Stokes' valuable paper in this Journal[b], and by Dr. Quain in his admirable memoir already referred to, that it would be a useless repetition introducing them here. These papers are well worthy the perusal of all interested in this subject. Rouchoux likewise mentions that slowness of the pulse indicates a general weakness of the parietes of the heart; and he gives some cases of slowness of the pulse. In one it was reduced to 25; in another, a man of eighty-eight years of age, a patient of Richerand, to 29 in a minute; in a third, a woman of eighty, it was 36; and in a fourth, a man of eighty-five years of age, who entered the infirmary afflicted with giddiness and fainting, the pulse only beat 20 strokes in a minute. After having remained during three or four days at the same "*rareté*," it descended one morning to sixteen or eighteen pulsations, and death occurred at this period. The same writer also states that Napoleon's pulse was only 40 in the minute, and was, besides, feeble[c]. As it is now well known that he was exceedingly fat, this substance being upwards of an inch thick upon his

[a] T. H. Holberton, Medico-Chirurgical Transactions, vol. xxiv. p. 76.

[b] New Series, vol. ii. p. 73.

[c] Dictionnaire de Médecine, Art. "Pouls." Deuxième Edition. Paris, 1842.

sternum, and one inch and a half upon his abdomen, when he died[a],—is it not probable, therefore, that his heart was also incumbered with this hydrocarbon, particularly when we associate his obesity with the slowness of his pulse?

The two following cases came under my own immediate observation, and present some interesting features. One assists in showing the connexion sometimes subsisting between cardiac and cerebral affections; and they both illustrate the relation of slow pulse to a softened and degenerated state of the heart. They also serve to throw some light on the preceding cases.

Mr. W——, aged 78, a gentleman of sedentary habits, in the year 1850, when standing before the fire, suddenly became faint, and fell, but recovered immediately; he had no unpleasant after-symptom, and was able to resume his professional occupation next day. In some days afterwards, however, he remarked that whenever he made any exertion, his breathing became oppressed, particularly by walking or ascending stairs.

August 5, 1850. Pulse only 38 in the minute, and jerking; visible pulsation of the brachial, radial, carotid, and temporal arteries, which are thrown out in bold relief; dulness in the cardiac region, more extensive than natural; heart's impulse pretty strong,—a muffled *bruit* accompanies its first sound, which is audible at the apex, and becomes very distinct over the aorta. After each beat of the heart, as in Dr. Law's case[b], "there is a species of commotion of the organ, as if another pulsation was attempted." His face is pale; tongue foul; appetite

[a] "Qui, au milieu des fatigues continuelles de la guerre, de la contention d'esprit qu' exigeaient sans cesse les soins politiques et administratifs d'un immense empire, qui, enfin, avec l'aiguillon toujours pressant d'une ambition effrénée, et au milieu d'événemens qui renversèrent la plus haute fortune à laquelle un homme ait pu parvenir, acquit et conserva, malgré la plus grande frugalité et cette prodigieuse activité morale et physique, un embonpoint assez considérable."—*Dictionnaire de Médecine*, Art. "Polysarcie."

[b] See Dr. Stokes' Paper, vol. ii. of this Journal, N. S.

bad; stomach flatulent; ankles œdematous; urine scanty, high coloured, acid, and free from albumen.

In consultation with Mr. Adams, it was agreed that our treatment should consist in diuretics, a nourishing diet, with a liberal quantity of wine and Seltzer water; and we ordered him to abstain as much as possible from muscular exertion, and to limit himself to driving.

On the 27th of August, 1850, his pulse had fallen to 32; he became considerably oppressed in his breathing; his appetite was very bad, and he was very weak. His treatment consisted in the administration of tinctures of bark and calumba with Brandish's solution; and he was ordered to have the following draught always at hand, in case the oppression of breathing should return:—Sedative liquor of opium, six drops; Hoffman's anodyne liquor, and aromatic spirit of ammonia, of each, half-a-drachm; and camphor mixture, an ounce.

September 9th. The urine became more copious; his pulse was 32 in the horizontal, and 36 in the sitting posture; the *bruit* was the same. He was ordered to take blue pill and squill in addition to his other medicines.

10th. His pulse fell to 28, and he had some irritability of bladder.

24th. He became greatly oppressed in his breathing, and his pulse fell to 24. A couple of glasses of wine relieved the breathing, and raised the pulse to 31.

October 11th. He was seized with an unpleasant sensation in his head, and a tendency to syncope, which was warded off by wine.

25th. Pulse 38. When at dinner on this day, he was seized with involuntary action of the muscles of his left fore-arm (in which part there is also slight numbness), so that he could not guide his fork to his mouth. The penis and scrotum are now œdematous; he complains of great oppression on the slightest exertion.

May 1, 1851. Became affected with pains in the extremities of some of his toes, in addition to his other symptoms.

11th. It was agreed in consultation with Dr. Stokes and Mr. Adams to try two ounces of the following mixture, three times daily :—Infusion of quassia, a pint; and tincture of the acetate of iron, an ounce : mix.

27th. Mr. W—— became very unmanageable and uncontrollable to-day, and is affected with the most ridiculous delusions. He remained in this state until July 8th, when he became composed, and his maniacal symptoms ceased.

September 11th. Has had no return of the mental disturbance; he gets up every day, and eats with a good appetite; pulse 32 to 40; no alteration in the cardiac murmur; the anasarca is but very trifling. He went on very well, his pulse ranging from 36 to 40, until May 15, 1852, when he again manifested symptoms of declining intellect, not knowing his wife nor some of his most intimate friends. Between this date and the 29th, he took but little food, and his pulse averaged 31.

June 2nd. He still labours under delusions, and he was disposed to be violent.

6th. He did not know Mr. Adams to-day, and would not let him feel his pulse. The delusions continue; he takes but little nourishment, and is chiefly supported by wine; pulse 30 to 36; complained of pain in the region of the heart.

17th. Intellect much impaired; is very weak; pulse 30; supported by wine.

25th. He is very low; pulse ranges from 36 to 40, but it is weaker than at any time since his illness began; his hands are of a dark, mottled, livid colour, and cold; tongue dry and brown. His intellect brightened up a little, so that he recognised his wife, and took leave of an old friend; passes urine involuntarily.

28th. Pulse 38.

29th. Pulse 41, very weak; he seems very low to-day.

30th. Greatly prostrated; pulse has risen to 52, but is excessively weak. He lingered till 9 o'clock, A. M., 1st July.

My friend Dr. Mayne made the post-mortem examina-

tion thirty hours after death. On opening the thorax, the lungs were seen to be remarkably healthy. The heart was very large and flabby, and all its cavities were dilated, and full of blood. The walls of the left ventricle were about half-an-inch thick, and so softened that they were very friable, and easily torn. In the anterior wall of the right ventricle there was a deficiency of muscular fibres, and their place was occupied by fat in different parts, so as to give the interior of this wall a yellow, mottled appearance[a]; and a

[a] Dr. Quain reduces the forms under which fat presents itself as a disease of the heart to two. "In one of these forms the fat, composed of large cells containing oil, identical with the fat found in other parts of the body, grows upon and extends over the surface of the heart; it then encroaches on and insinuates itself between the muscular fibres, in some cases to such an extent as to completely conceal them when the examination is made with the unassisted eye. In the other form of disease a fatty matter, composed of granules and small oil globules, occupies and fills the sheath of what was previously muscular fibre. In the one form of disease fatty tissue grows on and outside the fibre, in the other the muscular fibre itself degenerates into molecular fatty matter." The first Dr. Quain calls fatty growth, the second fatty degeneneration.—*Op. cit.* p. 123.

"The fat may so completely envelope the heart that none of the muscular tissue can be seen on its external surface; fat rarely occurs on the surface of the organ without insinuating itself between and encroaching on the heart's fibres. The muscular fibres become thinner and thinner, until the carneæ columnæ appear to arise from a mass of fat. This is nothing more in many cases than an hypertrophy of fat."—*Op. cit.* p. 124.

"In all cases the course and direction of the fibres are more or less modified and distended; the fibres, though they are overwhelmed with fat, may still retain their organization. In these cases there is neither a degeneration nor metamorphosis of muscle, but a growth or hypertrophy of fat upon it, though in many cases some of the fibres will be found degenerated. The fibres still existing, though concealed, explain the persistence of the heart's action in those cases in which the muscular walls appear to a greater or less extent replaced by fat."—*Op. cit.* p. 125.

"When a portion of the heart in a state of fatty degeneration is examined, the first thing which meets the eye is a want of the transverse striæ which mark the fibres of all the voluntary, and less distinctly those of the heart amongst the involuntary, muscles. When a portion of the object in which the disease has but commenced is examined, it will be observed that, in addition to the faintness with which the cross markings are seen, a number of dark small dots stud the fibres in many points, evidently situated within the fibre. A few such dottings do not appear inconsistent

couple of the carneæ columnæ in this situation seemed to be converted into this substance. The microscope detected fatty growth in great abundance here. Some of the fibres of the parietes of the left ventricle have a very granular appearance, with absence of the transverse striæ. Scarcely a trace of muscular fibre in some parts of the walls of the right auricle, large oil globules occupying their place. The parietes of the left auricle much occupied by fatty growth, and some of the fibres in a true state of fatty degeneration. Atheromatous deposits in the coronary arteries, but they are not ossified; the same substance exists in the parietes of the arch of the aorta in a slight degree. The aortic valves healthy, with the exception of a small warty excrescence attached near the free edge and under surface of one of them; these valves do not permit regurgitation of water into the ventricle. Atheromatous deposits to a slight extent in the mitral valve. The lining membrane of the left auricle very much thickened and opaque. A light-coloured coagulum, probably of some days' standing, was entangled by means of slender processes amongst the mus-

with a tolerably healthy state of fibre, and they are frequently found in hearts which have well performed their functions. As the observer, however, approaches the seat of more decided disease he finds that the cross markings have in many points disappeared, and that the black dots have increased in size and number; some of the dots are now found to be transparent in the centre, and to assume some order in their arrangement; sometimes the centre of a fibre is occupied by a long row of opaque points, forming a continuous line in the centre of the filament, sometimes two or three lines lie side by side, the dark lines being broken by transparent apertures or circles; less frequently the lines lie transversely to the fibre. Thus may be traced, as Mr. Paget has described, the change from the particle of molecular fat, the black dot in the fibre, to the large oil globule with its transparent centre. This fat, be it remembered, is not in the ordinary fat cells, such as are found on the surface of the heart or amongst the fibres; the fat globules placed within the fibre are much smaller, appear to have a mere albuminous envelope, and are extremely like the oil globules of milk." —*Op. cit.* pp. 125, 126.

See also Rokitansky, Pathological Anatomy, vol. iii. p. 312; and vol. iv. p. 203, Sydenham Society's edition; and Dr. Ormerod's Observations on the Clinical History and Pathology of Fatty Degeneration of the Heart. London, 1849.

culi pectinati of the right auricle. Permission to examine the head was not obtained.

I am indebted to the kindness of Dr. Mayne for the permission to take notes of the following case.

James Duff, aged 73, a very short-necked, stout-made man, states that about twelve months since, whilst wheeling a hand-cart, he became faint, and fell down, but recovered in a few minutes. Three months afterwards, whilst at the same occupation, he had a second fit, and recovered as quickly as on the first occasion. In about another space of three months, while sitting before the fire, he felt dizzy, and would have fallen into it, but for the assistance of a person sitting near him; he recovered immediately. None of these attacks were followed by paralysis. During the last eight months he has been much annoyed by frequent calls to pass water. He never suffered from palpitation, or any uneasiness about the heart. Early this month (September, 1851) his feet and ankles began to swell.

September 15, 1851. Present symptoms:—Visible pulsation of the temporal, carotid, brachial, and radial arteries; pulse 44, when he is in the horizontal, and 48 when in the sitting, posture, but it has been so low as 32. Thorax is very prominent anteriorly; slight dulness in the cardiac region; the rest of the chest has the morbid resonance indicative of emphysematous lungs. Heart's sounds distinct, but there is a soft murmur with the first sound, audible at the apex and over the aortic valves; impulse of heart not stronger than usual. Both jugular veins are very much distended, particularly when he is in the horizontal position. Urine coagulates with heat and nitric acid; specific gravity, 1014. Prostate gland very much enlarged, which causes great flattening of the stools. The arcus senilis is very well marked in both eyes, being semilunar, and situated in the upper part of each cornea. Dyspnœa is brought on by walking or by going up stairs, and he is frequently obliged to stop to recover himself. Bowels generally consti-

pated; tongue furred. None of his family ever, to his knowledge, had heart disease, but one of his sisters died of phthisis. He was ordered diuretics; wine and gin punch, with good diet, and an occasional purgative.

October 1st. The anasarca has increased very much during the last few days. Pulse 38 when lying down, and 40 when he is sitting up; it is irregular to-day. Urine scanty, of a dark colour; coagulates with heat and nitric acid. He was ordered to take two ounces of the following mixture, three times in the day:—Infusion of calumba, a pint; tartarized iron, two drachms; mix: and to continue his wine and gin.

3rd. Urine much increased in quantity; anasarca lessened; cardiac symptoms the same.

22nd. Three days ago the anasarca began to increase; effusion was manifest in both pleuræ. He became greatly oppressed and drowsy; yesterday he lapsed into coma, which continued until his death at nine o'clock last night.

The autopsy was made sixteen hours after death. There was a thick layer of fat under the integuments, particularly of the abdomen. The arteries at the base of the brain were brittle, and studded with bony deposits. The arachnoid membrane was slightly opaque in some places; three ounces of subarachnoid effusion; pia mater very slightly congested; brain not so firm as usual, and about an ounce of serum in the lateral ventricles. Serous effusion in both pleuræ. The anterior surface of the pericardium was covered by a thick deposit of fat. On opening this sac it was found to contain a small quantity of serum. Heart hypertrophied, and its whole surface covered by a layer of fat, which only allowed the auricular appendices to be seen; this fat was thickest at the grooves for the coronary arteries; it extended for about an inch up the pulmonary artery. Coronary arteries ossified, the right the most so. The walls of the left ventricle, when cut into, were found to be at least three-quarters of an inch thick, and the muscular substance was paler than natural. Both this ventricle and its

auricle were occupied by recently coagulated blood. The right side of the heart was large, and its cavities were dilated, the muscular fibres pale, and the ventricular walls very thin. The mitral valve was very much ossified, and evidently allowed regurgitation into the auricle. The aortic semilunar valves were studded with sharp bony spiculæ near their insertions, but they did not allow water to pass into the ventricle. There were ossific deposits in the aorta at the origins of the innominata, carotid, and subclavian arteries; these vessels were also extensively ossified, and the thoracic aorta was in some situations almost converted into a bony tube. The liver had the nutmeg appearance, and the kidneys were in an advanced stage of fatty degeneration.

Dr. Frazer kindly assisted me in examining the heart microscopically. We found fibres of the organ in a state of fatty degeneration in the following parts:—the septum of the ventricles corresponding to the fissure for the left coronary artery; portions of the right auricle and of the right ventricle near the apex. We also found fatty growth between the fibres in different situations.

Mr. W.'s case is of considerable interest; for in addition to the slow pulse and cardiac degeneration, he was affected with temporary mental alienation, which it is more than probable depended upon the state of the heart, and that they stood, with regard to each other, in the relation of cause and effect. Whether undecarbonized blood circulating through the brain disturbed its functions[a], or whether the head symptoms were produced by disturbance of the balance of the circulation, it is difficult to say. The following observations of Dr. Burrows are of interest here. He tells us: "That Dr. Clendining has

[a] "l'Altération des fonctions du cerveau a lieu par trois causes: 1°. Son engorgement sanguin; 2°. l'Infiltration séreuse et l'epanchement aqueux; 3°. l'Altération du sang artériel devenu noir, et ne pouvant plus par conséquent produire la même excitation."—*Corvisart*, Maladies du Cœur, p. 391. Paris, 1811.

known many cases of inflammatory disease, and several of mania and delirium tremens, which, although of no extraordinary severity in themselves, proved fatal, notwithstanding all the usual remedial means; and such event was wholly owing, as Dr. Clendining thought, to affections of the heart." Dr. Burrows also mentions:—"That these observations perfectly coincide with his own experience; and so assured did he feel as to the influence of diseases of the heart upon the functions of the brain, that he has little doubt but that if auscultation were generally employed among the insane patients in the large lunatic asylums, that numbers would be found suffering from cardiac lesions, which, by disturbing the cerebral circulation, tend to keep up the disordered functions of the brain. He also believes it will be found that diseases of the heart play their part as an eccentric cause of irritation, exciting or increasing disorders of the intellect to an extent which is not at present suspected"[a].

After I had written so far, I obtained, through the kindness of Drs. Mollan and Tuohill, Physicians to the Richmond Lunatic Asylum in this city, permission to examine a considerable number of the patients in that Institution, but I did not find cardiac disease so frequent among the inmates as I had expected. At the period I made the examination there were about 400 patients in the establishment, and the following is the result of the inquiry:—I examined altogether 269 patients, the remainder being so refractory that a satisfactory examination could not be made. Of the 269 patients so examined, 144 were males, and amongst these I found 5 patients in whom there existed confirmed cardiac disease. The number of females examined was 125, and out of these there were only 3 who exhibited unequivocal evidence of disease of the heart.

I have impartially stated the results of this inquiry, as the facts may be useful to others; but I cannot take upon myself

[a] *Op. cit.* pp. 179, 180.

to say, whether the proportion of lunatics thus affected with cardiac disease is large or small, as I have not at present before me any data that enable me to judge of the relative frequency of heart disease in the community at large. I am, however, inclined to the opinion that, although in some cases heart disease and insanity evidently bear the relation to each other of cause and effect, yet that such is not of so frequent occurrence as some authors would lead us to suppose.

Mr. Canton first promulgated the opinion that the *arcus senilis* is a fatty degeneration of the cornea; he also has observed the degenerated state of the heart in cases in which it was well marked[a]. As I mentioned in the recital of Duff's case, this alteration of the cornea was very apparent, being semilunar, and situated in its upper part. It was not so, however, with Mr. W., for his corneæ were remarkably clear; indeed it was observed by Mr. Adams that he rarely observed this part of the eye so clear in a person so advanced in years as Mr. W. It must be evident, therefore, that there is no necessary connexion between this state of the cornea and fatty degeneration of the heart. Dr. Quain, in speaking of this subject, reminds us, "that fatty degeneration of the heart may occur under circumstances and at an age when we would not expect to find this lesion of the cornea; so likewise, but in a much less degree, we may expect to find the change in the cornea independently of the change in the heart"[b].

Dr. Todd alludes to some cases in which the general law,—that in the erect, or standing posture, the pulse is most frequent; that in the sitting posture it is less frequent; and that it numbers still less when the person is horizontal or recumbent,—was reversed, the pulse in them being more frequent in the horizontal than in the upright position. He has frequently observed this peculiarity in connexion with feebleness of the heart"[c].

[a] Lancet, vol. i. p. 461, 1850. [b] *Op. cit.* pp. 161, 162.

[c] London Medical Gazette, N. S., No. 306, vol. xlvii. 1851.

On referring to the preceding cases it will be seen that this reversal of the law did not take place, for Mr. W.'s pulse was always increased in frequency on assuming the erect position, thus following the usual law; and in Duff the same also was observed until a few days before death, when I remarked that the pulse was uninfluenced by change of posture. There was another very interesting point about Mr. W.'s pulse, namely, its remarkable rise in frequency before death, an increase, however, that was accompanied by a great diminution in its strength.

Dr. Ormerod suggests that the slowness of the pulse which is so often noticed in fatty degeneration of the heart is characteristic of the second form of degeneration described by him in which the fat is deposited at the expense of the muscular tissue, in fact substituted for it and not merely laid upon it. I can draw no conclusion on this point from my two cases, for in both fatty growth and fatty degeneration existed together.

A diuretic plan of treatment was pursued in these cases, and at the same time we endeavoured to improve the quality of the blood by chalybeates, and by supporting the nervous system. This treatment was very useful with Mr. W., for his cardiac oppression was always relieved when the diuretics were acting well; but an increase of the anasarca was always accompanied by an aggravation of the dyspnœa. It was much less successful with Duff, and this is not to be wondered at when we recollect that he had fatty degeneration of the kidneys in addition to that of the heart.

The bad effects of muscular exertion on both patients was remarkable. I was one day driving with Mr. W., when he required to get off the car, and the exertion of walking a few yards brought on such great oppression that I feared for the result. On another occasion, contrary to advice, but being tempted by feeling well, he walked to the end of the street (a short one) in which he resided, when he became so faint and weak it was with difficulty he made his way home. He now became fully alive to the danger of walking, and restricted

himself ever afterwards to driving. Two of Duff's attacks of syncope were brought on whilst he was wheeling his hand-cart, and on different occasions when merely walking he had to stop to recover breath.

The great probabilities are, that patients with this disease will not be able to use muscular exertion; but if they can it should, as recommended by Dr. Quain, be always short of producing fatigue.

It is very difficult, however, to say when the disease commenced in any given case, and the first warning the patient may get of it is an attack of syncope, and it is probable, when this occurs, that the disease is somewhat advanced, and now muscular exertion may increase the tendency to these attacks. Exercise has been most warmly recommended in *fatty growth* of the heart; but we should recollect that this and true *fatty degeneration* may exist in the same organ[a]. "Fatty growth may occur alone, so may fatty degeneration, but as both are the result of a degraded and bad nutrition both may be often found in combination"[b]. Moreover, we are in this difficulty, we have not yet arrived at the knowledge of the diagnostic symptoms between the two forms during life; and, as Dr. Quain tells us, "there is no evidence to show that we can restore muscular fibres which have been destroyed," we must see the uselessness and danger of overtaxing the weakened organ.

The following numerical abstract, which I have compiled from the cases collected by Dr. Quain, in his admirable memoir so often alluded to in this paper, will show the liability to sudden death, and the consequent danger of muscular exertion in this disease. The number of cases given by Dr. Quain are eighty-four, and are divided into three series:—in his first series there are thirty-three cases, and of these twenty-two died suddenly, *twelve* of them being by syncope, and *six* from rup-

[a] Chambers on Corpulence, p. 121, 1850. [b] Quain, *Op. cit.* p. 151.

ture of the heart. In the second series there are thirty-six cases, of which twenty-six died suddenly, *four* being by syncope, and *sixteen* from rupture of the heart. And in the third series there are fifteen cases, of which twelve died suddenly, *one* being by syncope, and *three* from rupture of the heart.

These cases speak for themselves, and should make us pause before we recommend muscular exertion in this disease. Should syncope be produced the imperfect and enfeebled organ may not be capable of resuming its functions. "If," to use the words of Mr. Adams, "the three important organs, the heart, the brain, and the lungs, the 'tripod of life,' as they have been aptly denominated, be not all equally strong at a time when animation has been accidentally suspended, the weak one cannot be roused to resume its functions. Thus under such circumstances what might have been supposed a simple faint has terminated in death"[a].

That apoplectic coma may occur in the course of this disease, there can be no doubt; and it seems to me to result, as Mr. Adams explains, from the "state of the ventricle incapacitating it from emptying itself with sufficient quickness to relieve the brain," and thus "indirectly producing a state of congestion of its vascular system"[b].

This congestion, however, is not of an active character; indeed, Dr. Stokes mentions, in his paper on Slow Pulse, that his experience coincides with that of Professor Law, in that "the pseudo-apoplectic attacks in cases of slow pulse and weakened left ventricle are more frequently attributable to a diminished or feeble circulation than to one of active congestion;" and in the same communication it will be seen that he ordered one of his patients, on leaving the Meath Hospital, "never to allow himself to be bled, when threatened with one of his fits." A great deal, therefore, depends upon the discrimination and forbearance of the practitioner who may chance to be called to

[a] Dublin Hospital Reports, vol. iv. p. 359. [b] *Op. cit.* p. 400.

a person who has become suddenly insensible, and apparently comatose, for he may have very opposite states of the brain to treat. When I say forbearance, I allude to the strong prejudice in favour of the lancet which generally exists in the minds of the bystanders who may happen to be present.

Some short time since, I was called up early in the morning to see a gentleman who had been found insensible in a water-closet. I was with him in ten minutes after having been sent for, but although he was still quite warm, life was extinct, and he was pale and blanched. The people present all urged me to open a vein, but this I resolutely refused, and the consequence was, they formed a very low estimate of my professional skill. I was not sent for to make the post-mortem examination, but I subsequently learned from Dr. Corrigan that this gentleman died in a state of syncope, caused by the rupture of a small aneurism which was situated over one of the aortic semilunar valves, and which burst by a small pin-hole opening into the pericardium.

The words of Mr. Liston are here very apposite: "A practitioner," he remarks, "ought to think twice on the probable and possible effects in every case of disease or injury, before he determines upon and proceeds to open a vein for the purpose of drawing off the vital fluid"[a]. We should never, therefore, lose sight of the fact, that in a great number of cases of fatty degeneration of the heart the attacks are purely syncopal, and depend upon the weakened state of the organ. If we consider the history of the generality of these seizures, they would appear to be evidently of this character. A person with this disease uses some ordinary or unusual exertion; the heart being weakened, fails in its action, and the brain being deprived of the necessary degree of pressure, the person becomes insensible, and falls to the ground. Now this fall, if the patient be not seriously injured thereby, brings with it the cure of the fit; the

[a] Practical Surgery, p. 228, Fourth Edition.

body being thereby most advantageously placed for restoring to the brain its normal supply of blood, so that the individual, if he is to recover, regains his consciousness, and speedily rises up, without any impairment of intelligence or muscular power.

The following case so well illustrates these remarks that I cannot refrain from introducing it here.

Dr. Quain was suddenly called to a patient, "and found him, as he believed, dead. He had been in his usual state, and taking his dinner a few moments previously. Though neither pulse nor respiration could be perceived, nor in a hurried examination could the sounds of the heart be heard, I felt," observes Dr. Quain, "from something about his appearance, that he was not dead. An electro-magnetic apparatus was set to work from the spine to the region of the heart; other stimuli were made use of, and after several minutes he slowly recovered. He lived for two years afterwards! The heart was in a state of fatty degeneration." If, instead of having recourse to the stimulus of galvanism, an opposite mode of treatment had been pursued in this case, and blood had been abstracted, how very different would have been the result!

Art. XIV.—*Observations on Lithotrity, illustrated by Cases.* By Samuel G. Wilmot, M. D., Surgeon to Steevens' Hospital, &c. &c.

The number of cases of calculus in the bladder, in which, of late years, the operation of lithotrity has been successfully performed, and particularly the marked success which has crowned the practice of M. Civiale, of Paris, ought to be sufficient to remove those objections which were formerly with justice urged against the operation, and fully justify the observation of Sir Benjamin Brodie, "that with the exception of those which occur in children, there are few cases of calculus of the bladder in which it is not to be preferred to lithotomy." According to a report furnished by M. Civiale of cases of stone litho-

tritized by himself, out of 303 patients who underwent the operation 296 were cured and 7 died, and of the deaths 6 only were to be fairly counted, 1 having been a relapse case, and not operated on by himself. Let us compare the ratio of mortality as here given with that of the operation of lithotomy performed on the adult, and how striking will be the contrast! Notwithstanding these facts, strong prejudices still lurk in the minds of many surgeons against lithotrity. It is argued, and not without a good show of reason:—1st. That if one particle of the broken-up calculus remains unexpelled, it must become the nucleus of another stone. 2nd. That the operation is more painful and tedious, and more uncertain in its success, than that of lithotomy. 3rd. That inflammation, nay even gangrene, of the bladder, and abscesses in the areolar tissue of the pelvis may occur. 4th. That renal disease is very apt to supervene upon the operation. And 5th. That the fragments are apt to become impacted in the urethra, and thus to produce much annoyance and, perhaps, retention of urine.

The first objection—that of the chance of relapse—is, perhaps, the most cogent one; but a little reflection will show that it does not possess as much weight as would at first sight appear. If the urethra be previously well dilated, immensely large fragments will be easily expelled from the bladder. My friend Mr. L'Estrange has shown me two portions of a calculus which were expelled through the urethra after a single sitting, his own instrument having been the one employed: each fragment is of extraordinary size, and, with some little detritus, conjointly constituted the entire calculus. Many, however, object to dilating the urethra, and indeed in some cases it cannot be attempted on account of the irritability of the bladder it is sure to excite; but without any dilatation, the urethra of the adult is capable of passing very large fragments of calculus with ease, and without pain. It would appear as if the urethra possessed a certain power of adaptation, by which

it yields to the passage of foreign bodies, and thus guards against the dangers of any impediment to the discharge of the bladder's office. If, then, the urethra, even though undilated, will admit the passage of such large fragments, there can be but little chance that when the calculus is completely broken up any portion will remain behind. But should a fragment too large to enter the canal be left in the bladder, the fault is the surgeon's, who should have detected its presence; for no case of calculus should be considered as cured by the operation of lithotrity until by frequent and careful examinations with sounds of different shapes, furnished with a sounding-board, no remnant of it can by possibility be discovered. Again, some of the cases reported as relapses are doubtless not strictly such, being instances of the descent of another calculus from the kidney.

The second objection against lithotrity obtained with force some years ago, when the instruments employed were the large and heavy lithotrite of Heurteloup and the hammer; but now, owing to the lightness and simplicity of the instruments in use, the substitution of the screw for the hammer, and the greater dexterity possessed by the operator in seizing the stone, the operation is by no means a severe one. The cure performed by it is, no doubt, tedious when compared with lithotomy, but this is of minor importance; and as to the uncertainty of it, if the observations already made possess weight, lithotrity is not so uncertain of complete success as some would represent it to be.

The third objection holds good in but few cases. The occurrence of acute cystitis generally, but not always, results from rudeness upon the part of the operator, or from a disregard of certain precautionary measures upon the part of the patient or the surgeon, or both. As to the occurrence of gangrene of the bladder, and of abscesses in the areolar tissue of the pelvis, there are but few cases on record of these sad events; and they

must, in most instances, have been the result of some injudiciousness upon the part of the operator.

The fourth objection is a serious one, but it is, I feel certain, more apparent than real. It is not so much that renal disease is a likely consequence of lithotrity, as that the operation is frequently performed while the disease exists in an incipient state, and which must, of course, be accelerated by it. Sir Benjamin Brodie says: "It is far from being my opinion that the existence of disease of the kidneys, if it be in no very advanced stage, is an insuperable objection to the operation of lithotrity." In two cases, however, in which the patients died after the operation, he attributes their deaths to the pre-existence of extensive disease of the kidneys. Indeed we undertake lithotrity (and, to a certain extent, justifiably) in spite of contra-indications, which would deter the rashest surgeon from the performance of lithotomy; we need not, therefore, feel surprised if the success of the operation be not as generally permanent as it otherwise would be.

The fifth objection should be considered rather as a disadvantage than as an objection; and in any point of view it is not very weighty, since the impaction of the fragments in the urethra does not often occur, and when it does, its effect is in general easily obviated.

Such, then, are some of the objections put forward against the operation of lithotrity, but we see that when accurately analyzed, they become deprived of much of the force they appear to possess. The operation, however, is not without disadvantages which the most biassed in its favour must allow, and indeed its advantages even are comparative, not absolute; we resort to it not because it is perfectly free from ill results and altogether unobjectionable, but because as compared with lithotomy in the adult, it is far safer and may be performed under circumstances in which the latter is out of the question.

Having recently performed lithotrity in three instances in succession, I wish here to lay the results faithfully before the profession.

The first case was that of a young man aged 23, who had laboured under the symptoms of stone in the bladder for four years. I sounded this patient three or four times before I could satisfactorily detect the calculus. Indeed at no time could I succeed in feeling it in the ordinary manner; it was always necessary to resort to one of two expedients: either to make him stand up and pass urine, by which the calculus fell towards the neck of the bladder, then, when he lay down, upon introducing a sound, it was readily detected; or by introducing a metallic catheter, and drawing off the urine while he stood, when, as the last of the fluid was expelled, the calculus would be driven against the instrument, conveying to the hand the peculiar sensation experienced under such circumstances. Owing to the difficulty of feeling the calculus, and from some symptoms of which the patient complained, I conjectured that the foreign body was of small size, but, contrary to my surmise, actual measurement proved it to be very large.

In every respect this patient was well circumstanced for the successful performance of lithotrity. With the exception of the effects of the extreme pain and irritation caused by the presence of the foreign body in the bladder, he was in sound and good health; the bladder was capacious and very tolerant, nor was there any evidence of inflammation or undue irritation in its mucous coat, and there was not the slightest ground for the supposition of there being any renal complication. The urine was examined by my friend Mr. Fleming, of the Richmond Hospital, and the following was the result:—Specific gravity, 1020; re-action acid; oxalate of lime crystals; also a few pus, mucous, and blood globules, visible under the microscope; no albumen present. For some time previously to the operation being undertaken the patient was kept very quiet, during which the usual preliminaries of accustoming the ure-

thra to the passage of catheters, and of dilating it by gradually increasing their size, were carried out.

At the first sitting the calculus was seized and crushed but twice: the patient complained of a good deal of pain, and was extremely timid and nervous. At the second, which followed in a week after the first, the calculus was seized and crushed four times; he stated that he suffered much less pain than on the former occasion. At the third sitting the calculus was seized and crushed as often as six times; the patient bore it remarkably well, evincing scarcely any timidity, and appearing to suffer but little pain. Thus the mechanical reduction proceeded until the bladder was completely rid of a calculus which must have been of very large size, and the patient was restored to a state of ease and comfort to which he had been for many months a stranger. Long, however, before the calculus was entirely broken up, he began to experience almost complete freedom from pain, and was able to take exercise without any annoyance.

The fluid injected into the bladder was always allowed to be expelled by the unassisted action of the bladder; the small detritus was passed within twenty-four hours after the operation, but the larger fragments seldom escaped before the third or fourth day, sometimes not before the sixth. The very large pieces were never expelled until after he had walked about for some time.

After each operation an opiate was administered, and a hip-bath towards evening, and whenever any feverishness was excited, which occasionally occurred on the following day, a gentle aperient and some saline effervescing mixture quickly relieved the symptoms. Happily, no untoward results ever occurred in this case; rigors never supervened, nor did any fragments ever become lodged in the urethra. On one occasion, from the patient's statement it appeared as if a fragment had become impacted in the neck of the bladder, but the annoyance of which he complained was quickly removed by the introduc-

tion of a large-sized catheter. It is remarkable with what facility the calculus in this case was seized by the lithotrite; no manœuvring was requisite; it was merely necessary to press the instrument gently against the fundus of the bladder, when in general the stone would by its own gravity roll between the blades. Its structure was, however, extremely hard, so much so as to oblige the exercise of very great force in order to break it; on the first two occasions, it offered so much resistance that fears were entertained for the lithotrite, and it was deemed advisable to employ for the future a larger and stronger instrument. The debris of the calculus, as much as could be collected, weighs nearly four drachms; its composition is as follows:—"Oxalate, carbonate and phosphate of lime, the former preponderating."

It is more than a year since I operated upon this patient, and he continues to enjoy excellent health, and perfect immunity from urinary irritation.

The second case is that of a young man, aged 21, who had laboured under the symptoms of stone for some months. The patient was of stout make, but presented rather a delicate, strumous aspect. According to the statement of his father, he had symptoms of very great urinary irritation when an infant, and on one occasion passed two or three minute calculi. This case was as unfavourable for lithotrity as the other was well suited to it. The bladder was contracted and extremely irritable, and he suffered from frequent violent paroxysms of pain and difficulty in micturition. The urine was cloudy, and of a milky hue; its re-action was faintly alkaline; crystals of the triple phosphate of ammonia and magnesia, pus, mucus, and blood globules, were visible under the microscope; a small amount of albumen, not more than could be accounted for by the admixture of pus, was detectible by heat and nitric acid. There were other indications, however, which raised a suspicion that the kidneys were not perfectly healthy. A moderate-sized sound was passed a few times before the introduction of

the lithotrite was resorted to ; but no attempt at dilating the urethra to any extent could be made, as it invariably increased the irritability of the bladder and the violence of the paroxysms of pain.

The symptoms of urinary irritation at length increased so much, that I was recommended by Mr. Cusack not to delay the operation any longer. The calculus was measured, and was found to be fully an inch in diameter.

At the first sitting, it was with difficulty that a sufficient quantity of fluid could be injected into the bladder, owing to the extreme irritability of the organ ; the calculus, however, was easily seized and crushed a couple of times. On the following day the patient expressed himself as freer from pain than usual, but he had passed along with the urine a large amount of thick, tenacious mucus, through which a quantity of phosphatic detritus was diffused. He was ordered some decoction of linseed, with dilute muriatic acid, and tincture of hyoscyamus; and in the course of two or three days the mucus had nearly disappeared. This patient underwent only five sittings, until the entire calculus was reduced. At every successive operation the bladder was observed to become more tolerant, so that on the last two occasions he was able to bear twice the amount of injection, and to retain it with much less inconvenience. During the second operation, though not more than six ounces of fluid were injected, it was expelled while the lithotrite was working in the bladder, thereby causing great caution to be required in the movements of the instrument.

Before the calculus was completely broken up, the patient began to improve greatly in health, and to enjoy complete freedom from the paroxysms of pain with which he had previously been so much tortured; the irritability of the bladder greatly lessened; he could sleep throughout the night without being disturbed more than once or twice ; the urine became much clearer, and assumed an acid re-action, and he was able

to walk a considerable distance, and to bear the jolting of a car without inconvenience. One untoward circumstance, however, greatly marred the prosperous course of this case,—the impaction of fragments in the canal which occurred after every opetion, except the first, leading to a good deal of irritation, and some difficulty in expelling the urine. The fragments appeared to be generally arrested about the bulb, but neither I nor Mr. Cusack, who assisted me, was ever able to draw one forward by any sort of urethral forceps; however, we were enabled always so to alter its position, that it was expelled in the course of a few hours afterwards. On two occasions, when the fragment seemed to be farther back than usual, we succeeded in pushing it into the bladder.

The treatment pursued in this case consisted in the administration of opiates, which were obliged to be given largely; hip-baths, and the dilute muriatic acid. The debris weighs rather more than a drachm and a half, but this does not at all represent the size of the original calculus, as an immensity of it escaped in the form of fine powder, and much more of the coarser parts could not possibly be collected.

The composition of it is as follows:—"Crystalline triple phosphate of magnesia and ammonia."

It is now four months since the last operation was performed in this case. For a month afterwards he continued to improve in every respect, when, after exposure to cold, he was seized with a rigor, and pain in the region of the right kidney. The pulse became quick; he complained of nausea, loss of appetite, and urgent thirst; he had chills, alternating with heat of skin and sweating, which occurred at night; the urine was scanty, and of a deep brown colour; and when firm pressure was made over the site of the right kidney, pain was produced. These symptoms I viewed as indicating unmistakeably the superventionof some renal affection. I conjectured that, possibly, a new calculus had formed in the kidney, and had given rise to acute

inflammation of the organ. However, after the lapse of a fortnight, during which period he was treated for his new complaint, he became much better, lost the pain in his side, and improved a good deal in his health. He was then sent to the country, where he still remains, and, according to the report of his father, has become quite strong again[a].

The third case was less fortunate in its issue than the two preceding; though with respect to the operation itself, nothing could be more satisfactory as far as it had proceeded. When the calculus was broken up, with the exception of a few fragments, which the lithotrite at one sitting more would have completely crushed and reduced to a size adequate to pass through the urethra, death occurred under circumstances which could not justly be attributed to the operation.

The patient was aged sixty years. He was healthy; there was no appreciable enlargement of the prostate gland; the bladder was tolerant, and there was no indication of any catarrh of its mucous membrane; the urine was clear, and the calculus was of moderate size, but the urethra was narrow, particularly at the orifice, which was much contracted.

The calculus in this case was very readily seized with the lithotrite, and, owing to its friability, easily crushed. He had undergone three operations, and 78 grains of detritus were collected, when a new train of symptoms suddenly supervened.

The third operation was performed on Saturday, the 10th of July, with the same ease as usual, and without the occurrence of any untoward circumstance.

On the following Tuesday, the patient was found to be very ill, though up to this period he had not complained. His pulse was quick; tongue white and furred; there was tenderness on

[a] I saw this patient while the above observations were passing through the press: he has more than regained the health and flesh he had lost; and he states that he suffers no inconvenience whatever, and enjoys as good health as he had done before being affected with the calculus in the bladder. His urine is now quite normal.

pressure over the left iliac region, and a slight swelling was observable in the seat of inguinal hernia; symptoms of peritonitis rapidly supervened, and he soon sank and died.

This patient was a very passive, unobservant man, who could but imperfectly convey an idea of his sensations; it was not, therefore, easy to gain accurate information from him relative to the new change which appeared to have so suddenly occurred. It was ascertained, however, that for some years he had laboured under inguinal hernia of the left side, and was in the habit of wearing a truss very irregularly. The truss he had latterly worn, from being too strong, and from not fitting him properly, frequently gave him considerable pain by pressing unduly upon the abdominal ring. On the day of the last operation, the truss gave him so much pain he was obliged to leave it off. This occurred on Saturday, and from that day until the following Tuesday the soreness and tenderness in the situation of the hernia, where the truss had pressed, gradually increased.

Autopsical examination revealed extensive peritonitis. Upon slitting up the inguinal canal, an abscess was found within it, lying around the sac of the hernia. The intestine which had constituted the hernial protrusion was a portion of the large one; it lay fairly in the abdomen, but was adherent to the bottom of the sac by means of one of the appendices epiploicæ. Leading from the internal ring, but having no apparent connexion with the one in the inguinal canal, a large abscess was observed to pass behind Poupart's ligament, and to extend down into the pelvis, close to the side of the bladder. The bladder itself was contracted, and its mucous membrane was very vascular and villous; but no products of inflammatory action, neither lymph, pus, nor ulceration, could be discovered. Within it lay only three or four fragments of the calculus, which were left after the last operation, being too large to pass through the urethra, but which a few applications of the lithotrite would have completely reduced. The com-

position of the debris in this case is as follows:—"Lithate of ammonia and soda, united with colouring matter of the urine."

I am indebted to Professor Geoghegan for the analysis of the detritus in each of the above instances.

The foregoing cases are instructive in a practical point of view, and tend to confirm the following facts:—First, that lithotrity is, in general, an operation easy of performance, and is not usually attended with that amount of pain nor with those evil consequences which have been so strongly urged against it by its opponents. Second, that, when performed under favourable circumstances, its success is complete, and its results the happiest, as exemplified by Case No. 1. Third, that when carefully performed, and the incidental occurrences which are apt to arise properly attended to, the operation may be undertaken with a good prospect of success, even in cases not so suitably circumstanced for it, as proved by Case No. 2. Fourth, that, when the calculus is friable, even though of considerable size, three or four sittings are amply sufficient for its complete reduction, as shown by Case No. 3.

The unfortunate termination to the last case cannot be fairly attributed to the operation. It is true that Sir Benjamin Brodie mentions one case in which death resulted from the formation of a large abscess between the bladder and rectum, after the crushing of two or three small calculi, the bladder itself being only very slightly inflamed; he supposes that the abscess in his case was produced by "some very minute and sharp-pointed fragment" of the calculus penetrating the coats of the bladder, by which a drop of urine was admitted into the areolar tissue, and thus suppuration was excited. Whether this conjecture be probable or not, the explanation cannot apply to the case I have recorded. Here the abscess lay not between the bladder and rectum, but on the left side of the organ, high up; and it is not easy to understand how any mischief com-

mencing within the bladder could be propagated in this direction; on the contrary, that the cause of the suppuration depended in some way upon the old hernia is rendered more than proba ble by the soreness produced by the pressure of the truss for so long a time, by the presence of the abscess within the inguinal canal around the sac of the hernia, and by the co-existence of peritonitis.

It will be observed, that chloroform was not administered in any of these cases, and it ought, I think, if possible, to be avoided. In the operation of lithotrity (very different from that of lithotomy, in which the patient is mechanically bound in the proper position), a certain consent ought to exist between the operator and the patient, by which the latter suits his position on the moment to the exact object of the former, and which consent, of course, is destroyed when anæsthesia is produced. Besides, the inhalation of chloroform is very apt to excite automatic movements of the body, which materially interfere with the easy and accurate seizure of the calculus. Some time ago, in a case of stone in which I employed lithotrity, the extreme irritability of the patient rendered it very advisable to induce anæsthesia; but on the two occasions the chloroform was administered it produced such violent contractions of the abdominal muscles, I found it impossible to proceed cautiously with the operation.

The patients in the three cases here reported were always allowed to empty the bladder, after the operation, by the unassisted power of the organ; and this is, I think, preferable to the plan of introducing the large steel catheter, and washing out the bladder, as some have recommended, which greatly adds to the pain, and increases the irritation that follows. In some cases, however, in which the calculus has been much broken up, and thus a large amount of detritus formed, the neck of the bladder or the urethra is very apt to become blocked up, if the organ be allowed to empty itself. In such instances, there is no more effectual means of artificially re-

moving the fluid, and with it the detritus, and of thus guarding against the possibility of this occurrence, than the employment of the ingenious and scientific apparatus of Sir Philip Crampton, which accomplishes the desired object by atmospheric pressure.

The second case affords an example of one of the commonest results of lithotrity,—the impaction of fragments in the urethra. This event may occur in any case, but it is met with in the generality of instances in those only in whom the urethra is narrow or the mucous membrane of the canal is in a state of vascular turgescence, or when the bladder is very irritable or the fragments are sharp and angular. When the urethra is wide and the lining membrane not turgid, and the bladder free from irritability and the fragments rounded, impaction will rarely occur.

The chance, however, of this disagreeable occurrence, as the result of the operation of lithotrity, affords a strong argument in favour of previous dilatation of the urethra in all cases which will admit of the measure. It is well known that, except in somewhat advanced life, the neck of the bladder possesses a remarkable degree of dilating power, so that a foreign body which would with ease pass through it may become arrested in any part of the urethra, particularly in the membranous portion ; it is, therefore, only rational to endeavour, by mechanical dilatation, to suit the size of the urethra to the naturally dilatable neck of the bladder.

For the complete success of lithotrity there cannot be observed too much caution and gentleness in the manipulatory part of the operation, nor too much attention to the circumstances which should regulate the length of interval between each sitting, and the number of times the lithotrite is made to act on the calculus in succession. As a general rule, the calculus should never be seized and crushed more than twice at the first sitting, and a full week should elapse before the operation is repeated, the same rule being observed each subse-

quent time; and no matter how long the interval be, the irritation produced by one operation should have completely vanished before the next is undertaken. Better to let the cure extend over a long period, than, by an endeavour to shorten it, run the chance of exciting mischief, and of thus interfering with the successful termination of the case. Another precaution to be attended to in all cases accompanied with much irritation is the observance of strict rest and quietude for 36 or 48 hours after the operation. I feel confident that to a disregard of these points is to be attributed the unfavourable course which many cases of lithotrity are apt to take, rather than, as is very often supposed, to carelessness regarding what are considered to be contra-indications to the operation. Indeed, unless the calculus exceeds a certain magnitude, that it is encysted, that the prostate gland is very much enlarged, or that the kidneys are extensively diseased, there is no local condition which can be said to altogether contra-indicate lithotrity; and there certainly is hardly any state of the general health which would forbid the cautious adoption of the operation. In cases even where there is chronic phthisis or the like, lithotrity may often be resorted to as a means of relieving the excessive torture consequent upon the increasing growth of the calculus; generally before the calculus has been more than one-half reduced in size, the pain and irritation in the bladder greatly subside:—is it not, therefore, as well justifiable as merciful to have recourse sometimes to the operation, though no prospect of permanent advantage can be held out to the unhappy patient, and thus, by removing or diminishing a far greater source of suffering than the concomitant disease, to smooth the ruggedness of the path that gradually leads him to the grave.

Art. XV.—*Contributions to the Pathology of the Heart.* By Benjamin George M'Dowel, A.B., M.D., one of the Physicians to the Whitworth and Hardwicke Hospital, Lecturer on Anatomy and Physiology in the Carmichael (formerly the Richmond Hospital) School of Anatomy, Medicine, and Surgery, &c. &c.

The following observations are derived from an analysis of numerous cases of cardiac disease treated by the writer in hospital practice during the last few years, and which were carefully recorded as they came under observation.

It is not the object of this communication to enter upon the subject of heart disease in general, but rather to direct attention to the records of some cases which present in themselves peculiar features, and to allude to such general matters only, relating to the pathology and diagnosis of cardiac disease, as the writer feels he is enabled to do by the materials at his disposal.

Were the differential diagnosis and pathology of cardiac diseases clearly established, such a communication as the present might well be deemed superfluous, but as our knowledge of this class of diseases is comparatively recent and as yet imperfect, it seems desirable, as opportunities occur, to advance that knowledge by the results of clinical observation.

Organic diseases of the heart have been considered under two heads, as they engage:—1. Its valvular structures; and 2. Its muscular tissue. This classification has been found no less useful in practice than convenient in the study of morbid appearances. True it is that lesions of both structures often coexist, or even spring up together; but, on the other hand, in many instances they exist separately, or even where combined, they not unfrequently hold to each other the relation of cause and effect.

The valvular diseases of the heart have received by far the largest share of attention, and hence they are by many too ex-

clusively regarded as the sole cause, both of the symptoms and of the fatal result. Yet the morbid changes which affect the muscular tissue of the heart are no less deserving of our attention, as they assist us to explain the laws which regulate the fatality of heart diseases, as well as to understand better the differential characters of these affections.

At the present day it is comparatively easy to distinguish the several valvular diseases from each other. The chief difficulty seems to be in establishing the differential diagnosis in certain cases, between organic and non-organic diseases; and again (in cases of organic disease), in discriminating those in which there is valvular lesion from others, in which with healthy valves the muscular tissue and cavities of the heart have undergone morbid changes. To illustrate some of the structural changes which belong to this latter class is the principal object of the present comunication.

Section I.—THE EFFECTS OF EXCESSIVE DILATATION OF THE HEART, ESPECIALLY OF THE VENTRICLES, WITH SOFTENING OF ITS TISSUE, AS EXEMPLIFIED BY CASES WHERE THIS MORBID CHANGE EXISTED, UNCOMPLICATED WITH VALVULAR DISEASE.

Case I.—*Passive Dilatation of the Ventricles. Enlargement of the Heart and softening of its muscular tissue. No Valvular Disease. Signs of obstructed Circulation.*

Mary Byrne, aged 33, was admitted into the Whitworth Hospital under my care, October 12, 1846. She states that she has laboured under some of the symptoms of disease of the heart for the last fifteen months: palpitation was first complained of. Five weeks later she had an attack of hemoptysis which continued for two days. Six weeks prior to her admission into hospital, dropsical effusions became developed: her face and ankles first swelled, and subsequently the abdomen. She never at any time laboured under rheumatism. On her admission general anasarca and ascites, to a slight extent, were present; extreme distention of the legs by serous effusion ren-

dered her very helpless; while a frequent harassing cough, with scanty expectoration, increased much her sufferings; there was extreme dyspnœa occurring in paroxysms, and amounting to orthopnœa; the face was bloated, and so darkly congested as to be almost livid; the superficial veins of the neck were turgid; whilst the extremities were constantly cold and mottled. The urine was small in quantity and high-coloured, specific gravity 1016, not containing albumen. The digestive organs were much deranged

The chest generally yielded a dull sound, owing to anasarca of its parietes; cardiac region extensively dull; heart's impulse weak as contrasted with the apparent amount of cardiac enlargement; heart's action extremely irregular; second cardiac sound normal and distinct, whilst the first sound was accompanied or replaced by an evident murmur, heard most loudly over the heart's apex, but lost along the sternum. No *frémissement.* Radial pulse extremely small, weak, and intermittent, 108 in the minute. The signs of universal bronchitis with pulmonary congestion were present.

No treatment could be expected to have much influence under such unfavourable circumstances. Diuretics, purgatives, and diffusible stimulants, were employed with some benefit; subsequently blue pill in minute doses, with digitalis and squill was prescribed. On the 21st it was reported that much relief had been experienced, but all improvement ceased here, and her most unfavourable symptoms became more developed. With increasing dropsy there was increased dyspnœa, and death was impending from apnœa, when coma suddenly set in, and she died November 4th.

Post-mortem Examination.—The lungs were gorged with blood, but were not structurally altered; the cavity of each pleura contained about eight ounces of straw-coloured serum; the pericardial cavity half-an-ounce only. The heart was greatly enlarged; when washed out it weighed thirteen ounces; the left ventricle was extremely dilated; its walls were not

hypertrophied, and therefore bore no just proportion to the size of the cavity (dilatation was the predominant change, and hence the size and weight of the heart were not duly proportional, as they must be when hypertrophy predominates). The carneæ columnæ of the mitral valve were considerably enlarged; the mitral valve itself was healthy, except a small cartilaginous nodule, not larger than a grain of small shot, on its anterior flap; the left auriculo-ventricular opening was somewhat dilated, and consequently the normal relation as to size between the opening and its valve no longer existed; the left auricle also was more capacious than usual; the sigmoid valves of the aorta, the lining membrane of that vessel, and the valves of the right side of the heart, were perfectly healthy. The same changes were found in the right cavities, but in a much slighter degree. The substance of the heart itself was altered in appearance and consistence; its fibres were paler than usual, being of a yellowish-brown colour, whilst their cohesion was diminished; the muscular tissue was manifestly softened. The liver and kidneys were engorged, but were otherwise healthy[a].

Case II.—*Passive Dilatation of the Ventricles. Dilatation of the Left Auriculo-ventricular Opening. Enlargement and Softening of the Heart. No Valvular Disease. Signs of Obstructed Circulation.*

Isabella St. John, aged 63, admitted into the Whitworth Hospital under my care, December 11, 1847. On admission, in this case as in the preceding one, the symptoms were essentially those which are usually attributed to obstructive valvular disease. In addition to palpitations, distressing dyspnœa, and breathlessness,—the usual accompaniment of confirmed cardiac disease,—lividity of the face, remarkable turgescence of the jugular veins, and anasarca to an extreme degree, were present, and evi-

[a] For the report of this case I am indebted to Mr. Robert Cryan, who was my clinical clerk in 1846.

dently pointed to an obstructed circulation. The symptoms of cardiac disease had first appeared a year previously, and since then had gradually become more developed. Dropsy had been but lately superadded; she had never had rheumatism in any form; hemoptysis had occurred on more than one occasion. The cardiac signs consisted in considerable increase of the natural amount of dulness, a *bruit* at the apex with the first sound, a faint impulse, and an irregularly acting heart. The radial pulse was equally intermittent with the heart, and extremely weak.

It is unnecessary to follow this case through all its details from day to day. The distressing symptoms which have been enumerated admitted of no benefit from treatment. The dyspnœa increased, whilst the limbs continued to enlarge, until at last they became enormously distended. The circulation then grew more languid, and livid vesicles appeared on the legs as the forerunners of gangrene, when death put a period to her sufferings.

Post-mortem Examination, January 26, 1848.—The body was of great size from serous infiltration, as also from an excessive deposit of fat. The heart was large, flabby, and softened. Its left cavities were very much enlarged, without any increase in the thickness of their walls. The left auriculo-ventricular opening was remarkably dilated, and allowed five fingers to pass with ease. The venous system was universally gorged with blood, which was yet fluid, but presented no traces of any admixture with oil. The valves, without exception, were perfectly healthy.

In the two cases which have now been detailed, the cardiac lesions were essentially the same. In both there was an enlarged, softened, and dilated heart, with ventricles so much expanded, that their cavities had become disproportioned to their propelling power. These changes occurred independently of any valvular disease; for in Case I., the small spot of thickening, no larger than a grain of shot, cannot be considered to have inter-

fered with the functions of the mitral valve. The left auriculo-ventricular opening in both instances was dilated, so that although the mitral valve was perfect in point of structure, it was, nevertheless, quite inadequate to guard an orifice, dilated, as in Case II., to at least twice its usual dimensions. In both cases consequently there was regurgitation through the left auriculo-ventricular opening,—of which the *bruit* heard over the apex of the heart was significant,—and a languid systemic, together with an obstructed pulmonary circulation. Hence, in obedience to a well-known law, that morbid changes in the heart are propagated in a direction contrary to the course of the circulation, there resulted, engorgement of the lungs, enlargement of the left cavities of the heart, venous obstruction, and plethora, and lastly, general dropsy. As hepatic obstruction was but a part of the obstruction of the general circulation, we find that ascites occurred subsequently to anasarca, and existed to a comparatively slight degree. The prominent symptoms in these two cases were in all material points the same: they were also almost identical with those which characterize a contracted condition of the left auriculo-ventricular opening.

The following arrangement enables us to compare advantageously the prominent symptoms observed in Cases I. and II., with those which denote left auriculo-ventricular contraction:

Contraction of the left auriculo-ventricular opening.	*Passive dilatation of the ventricles; softening of the Heart.* —Cases I. and II.
An irregularly acting heart.	An irregularly acting heart.
An intermittent, feeble, and rapid pulse, not synchronous with the heart's impulse.	An intermittent, feeble, and rapid pulse.
Dyspnœa, hemoptysis, and pulmonary congestion.	Dyspnœa, hemoptysis, and pulmonary congestion.

Jugular pulsation and turgescence.	Jugular turgescence.
Cerebral symptoms.	Death by coma in Case I.
General dropsy.	General dropsy.
Jaundice (occasionally).	Jaundice (not observed).

It is to be observed, that "the want of correspondence" between the heart's action and the radial pulse, a symptom so much insisted on by Mr. Adams in contraction of the left auriculo-ventricular opening, did not exist in the cases of dilated ventricles, whilst the strong impulse of the heart in the former affection contrasts remarkably with the feebleness of its action in the latter.

Were the first-mentioned sign (want of synchronism between the impulse of the heart and the radial pulse) an *invariable*, and therefore a pathognomonic sign of a contracted mitral opening, the elements for establishing a differential diagnosis might be therein found, but it has occurred to the writer to meet with several cases in which this symptom was wholly wanting, and yet mitral contraction was proved to have existed on examination after death[a]. Probably it may be a constant

[a] A brief abstract is here given of three cases in which the pulse was regular, and synchronous with the heart's impulse, whilst, on examination after death, mitral narrowing was proved to have existed.

I.—Celia Long, aged 30, a patient of mine in the Whitworth Hospital, died January 28th, 1848. Cardiac disease supervened on rheumatism. Symptoms during life:—A very small and rapid but regular pulse; disproportionately strong action of the heart; bronchitis; dropsy.

Autopsy.—Left auriculo-ventricular opening so contracted as to admit the point of the little finger only; mitral valve opaque and rigid; left auricle greatly dilated and hypertrophied; aortic orifice contracted likewise.

II.—John Casey, aged 19. Whitworth Hospital. Died January 25th, 1850. Never had rheumatism. Symptoms during life:—Dyspnœa; bronchitis; hemoptysis; pulse small but regular; wild delirium occurred suddenly on the 24th, followed by profuse hemoptysis, which continued for twenty-four hours, when death occurred.

Autopsy.—Mitral valve rigid from bony deposits, opening contracted, and with the valve representing a bony thimble, terminating inferiorly in a narrow chink,

symptom in the advanced stages of the disease, when the narrowing has become so great that the ventricle sometimes contracts on an almost empty cavity.

The disproportion between the force of the heart's action and that of the radial pulse is a more valuable, because it is a more constant, indication of contracted mitral orifice. But, apart from other symptoms, this cannot be regarded as a diagnostic sign, since it may be present under other and different morbid conditions.

The difficulty of distinguishing between these affections will be further increased when it is considered that the other symptoms which have been in the table assigned to contraction of the mitral orifice are not necessarily connected with this condition exclusively. For example, hemoptysis may depend on passive dilatation without softening, as in Case v., or on aortic patency and dilatation, as in Cases vi. and vii. Jugular turgescence indicates engorgement of the right side of the heart; jugular pulsation, regurgitation through the right auriculo-ventricular opening; and these phenomena denote mitral contraction only, inasmuch as that lesion generally produces those changes in the right cavities of the heart on which the symptoms in question depend. Cerebral symptoms have been very generally referred to a contracted condition of the left auriculo-ventricular opening. No doubt apoplectic seizures do often occur in the course of this disease[a], and not unfrequently

though admitting the point of the finger superiorly; the left ventricle was the only part of the heart which retained its natural appearance; the other cavities were all very much dilated; the walls of the left auricle were immensely thickened. The lungs were gorged with fluid blood.

III.—Jane Carroll, aged 16. Whitworth Hospital. September 16th, 1846. Had acute rheumatism one year previously. Symptoms:—Anasarca; bronchitis; frequent hemoptysis; livid lips; pulse 120, very small but regular; contraction of mitral valve diagnosed. Six months afterwards she died in Dr. Banks' ward, and on examination a contracted condition of the mitral opening was found to exist.

[a] *Vide* Mr. Adams "on Diseases of the Heart," Dublin Hospital Reports, vol. iv. p. 416; and Cases i. and ii.

prove the immediate cause of the fatal result. But, at the same time, cerebral lesions may take place in any morbid condition of the heart which enfeebles the general or systemic circulation. The apoplectic death of Case I. has already illustrated this point; and in Cases IV. and VIII., to be hereafter detailed, cerebral symptoms will be found associated with dilated cavities and with mitral patency[a]. Neither does jaundice essentially belong to mitral contraction: in Case V. it will be found associated with aortic patency; and besides, contrary, perhaps, to what might *a priori* be expected, jaundice so rarely depends on heart disease, that its occasional development can scarcely be considered of much weight as an element of diagnosis.

If these remarks have conveyed the impression that the symptoms of passive dilatation with softening of the heart may readily be confounded with those of contraction of the mitral orifice,—the signs furnished by auscultation and percussion in these two classes of cases will scarcely clear up the difficulty. These signs are very similar in both classes. In Cases I. and II. there was detected by percussion an enlarged heart, whilst by auscultation a bellows murmur was revealed over the region of the apex, systolic as to the time of its occurrence, and single. Similar are the phenomena which are generally met with in practice, or described by authors, as associated with contraction of the left auriculo-ventricular opening.

It is stated by some authorities, that in mitral contraction a double *bruit* may be heard, one murmur being produced by the obstacle in the way of the blood entering the ventricle, the other by its subsequent regurgitation. The writer has never verified this observation, although he has examined a great many cases with reference to this particular point. It has oc-

[a] *Vide* Dr. Law's Observations on Disease of the Brain dependent on Disease of the Heart, Dublin Journal, vol. xvii. 1840.

curred to him, and not unfrequently, to meet with cases in which a double *bruit* was audible at the apex of the heart; but in all of them he could satisfy himself that one of the murmurs, at least, was propagated thither from some other locality.

Whilst the physical signs just enumerated are those which usually indicate mitral contraction, it must be clearly understood that their absence does not necessarily indicate valvular soundness. In many cases of mitral contraction no abnormal sound whatever indicates the lesion, and the diagnosis must then rest on general symptoms. The presence or absence of *bruit* does not appear to the writer to depend on the extent to which mitral contraction has advanced, as do the other symptoms. The *bruit* is chiefly due to regurgitation from the left ventricle into the left auricle. And as contraction of the orifice may occur without any impairment of the functions of the mitral valve, there may be obstruction and no regurgitation. In such cases there will consequently be no *bruit.* This was observed in another case[a].

Mitral narrowing, it would thus appear, may occur under at least two forms. In one, the morbid change affects the orifice chiefly, which is then reduced more or less in size, until it represents a "semilunar fissure," with the concavity turned towards the aorta[b]. In the other, the valve is likewise engaged, and becomes puckered, thickened, and shortened, whilst the opening is contracted; and not unfrequently both opening and

[a] As this case will not appear in the present paper, the following brief abstract of the morbid appearances is here introduced, in order to preserve the connexion of the subject.

Catherine Leonard, aged 40. Contraction of the left auriculo-ventricular opening. Admitted November 5th, 1851.

Post-mortem Examination, November 21st. — Heart much enlarged; right cavities greatly increased in size; in the left chambers hypertrophy predominated; the left auriculo-ventricular opening was considerably diminished in size; *but the leaves of the mitral valve were unaltered, and consequently quite capable of performing their functions.*

[b] *Vide* Mr. Adams' truthful description, *loc. cit.* p. 433.

valve are converted into an appearance like that of a bony thimble, the point projecting into the ventricle, and presenting a small, unyielding aperture, which not only obstructs the entrance of the blood, but allows of its partial regurgitation. But another circumstance may influence the existence or absence of *bruit* in mitral narrowing, viz., the amount of regurgitation. In those cases of valvular imperfection in which a considerable amount of fluid is transmitted with force through an altered opening, the murmur which results is always well developed, as, for example, the diastolic murmur of aortic patency, and the prolonged systolic murmur which accompanies mitral inadequacy. Where contraction of the left auriculo-ventricular opening is established, the tendency of the disease is to diminish the amount of blood entering the left ventricle, and in an equal degree the amount and force of its regurgitation into the left auricle (where the lesion is such as to admit of regurgitation). Now, this cause operates more and more as the narrowing goes on, until finally, when the opening is so much diminished that the ventricle can only get a "precarious supply of blood" (Adams) the amount of regurgitation must be extremely small, or, perhaps, only occasional. In accordance with these views, it is in the advanced stage of mitral contraction that a *bruit* is most frequently wanting[a].

It would appear, therefore, from the details of these Cases (I. and II.) that passive dilatation of the ventricles of the heart (with which dilatation of the left auriculo-ventricular opening is generally associated), and softening of their muscular walls, will be attended with a group of symptoms and of physical signs which are almost identical with those which usually de-

[a] Mr. O'Ferrall has clearly shown that the progress of mitral contraction may cause the disappearance of an originally well-developed murmur. He explains this occurrence by supposing that the shortened valve becomes again adequate to its task in consequence of progressive contraction.—*Vide* Mr. O'Ferrall's "Clinical Researches on Diseases of the Heart," Dublin Journal, First Series, vol. xxiii. 1843.

note a contracted condition of the left auriculo-ventricular opening.

Section II.—passive dilatation and enlargement of the heart, depending on disease of the coats of the aorta, and producing the signs of an obstructed circulation.

Case III.—*Extreme Dilatation and Enlargement of the Heart. Atheromatous Degeneration of the Aorta. No Valvular Disease. Signs of obstructive Heart Disease.*

Timothy Houston, aged 61, was admitted into the Whitworth Hospital, under my care, January 6, 1852. He had laboured for several years under the symptoms of heart disease, but dropsical symptoms had only lately appeared. A year previously he had incomplete paralysis of the left arm and leg, for which he was in the Whitworth Hospital, in Dr. Gordon's ward, and which was removed by treatment. Increasing dyspnœa and anasarca were of late the symptoms of which he chiefly complained.

On admission he was universally dropsical. Ascites existed to a slight degree only. The lungs were congested, and cough was very troublesome. Breathlessness and dyspnœa were constantly present, but at times there were paroxysms of difficult breathing, with palpitations, which rendered the horizontal position insupportable.

The pulse was small in volume, and regular. The heart was manifestly enlarged, and that to a considerable degree. Its impulse was quite out of proportion to the smallness of the pulse. The sounds of the heart had a muffled character, and were difficult to analyze; but no abnormal *bruit* could at any time be detected. The jugular veins were turgid. The face was invariably pale.

Soon after his admission this patient was attacked with hemoptysis. The blood was florid, and was expectorated in considerable quantity, mixed with thin, frothy mucus. The

signs which indicated pulmonary apoplexy were these :—A sharp, crepitating *râle* over the lower lobes of both lungs posteriorly, with absolute dulness on percussion, but without the bronchophony or bronchophonia which would accompany the same degree of loss of sonoriety, in a case of pneumonic consolidation. Moderate venesection, at this crisis, was well borne, and gave great relief. The pulmonary hemorrhage continued for a fortnight, and then gradually ceased. But whilst the crepitus disappeared, the healthy resonance of the chest was not restored.

From this period the paroxysmal attacks of dyspnœa became more periodic, and assumed all the features of distressing angina. This painful complication continued to the close of life. The lower extremities had, by this time, become so distended, that a few punctures were made with a small needle: a copious flow of serum was the result, by which the anasarcous swellings were greatly diminished. Towards the close of life there was less suffering than might have been anticipated, for a drowsy condition became manifested, accompanied by decided imbecility of mind. He now almost ceased to suffer, and dosed away nearly all his time, either in an easy chair, or propped up sitting in bed. It was surprising how long life was protracted in this condition. For upwards of three weeks this state of stupor continued, when complete coma occurred, followed, after a few days, by death.

Post-mortem Examination, May 1st. — The lungs were rather small in bulk, although they were emphysematous. Their lower lobes had been the seat of pulmonary apoplexy. On incising them, several large, dark-coloured masses appeared, which were evidently old coagula. The intervening portions of pulmonary tissue were somewhat condensed, whilst the remainder of the lungs was essentially healthy.

The heart was very much enlarged: it extended greatly beyond its normal limits. When washed out, and separated from all its connexions, it still weighed twenty-eight ounces.

In form it was not much altered, except that its apex was more rounded than usual. There was hypertrophy, with excessive enlargement of the ventricles, especially of the left. The muscular tissue had its natural firmness. The valves were perfectly free from disease, and the most rigid examination failed to detect the slightest imperfection in them[a]. The carneæ columnæ were not hypertrophied (as they are generally observed to be in cases where regurgitation has been allowed). The aorta, throughout almost its entire extent, was brittle, from extensive atheromatous depositions, and its elasticity, from this cause, was sensibly diminished. There were no evidences of recent inflammation of the aorta.

Case IV.—*Extreme enlargement of the Heart. Dilatation of the Ventricles. Signs of obstructed circulation. No Valvular disease, but extensive atheromatous degeneration of the Aorta.*

Very similar to the preceding was the case of a man named John Clarke, aged 60, who was under observation for a short time in the latter end of August, 1851. He was admitted into the Whitworth Hospital labouring under ascites and anasarca, accompanied by extreme difficulty of breathing. His other symptoms were as follows:—His face was bloated and

[a] The valves were severally tested as to their adequacy in the following manner:—The pipe from a water cistern was introduced into the aorta and secured to it by a ligature. On allowing a full stream of water to flow into the artery, it was found that none of the fluid passed the sigmoid valves. Their competency to prevent regurgitation was therefore manifest. To test the mitral valve the aortic sigmoid flaps were broken down, and the aorta secured on the pipe as before; the water was now allowed to rush into the left ventricle, but though the mitral flaps were floated up, and even made to bulge upwards, owing to the pressure to which they were subjected, yet none of the fluid passed into the left auricle. The mitral valve was thus shown to be perfect. The integrity of the valves on the right side was similarly tested, and with the same result.

This method, which, with reference to the aortic valves, the writer first saw adopted by Dr. Corrigan, is so easy of application that it may be employed whenever it is desirable to determine with certainty the adequacy of the valvular apparatus of the heart.

congested; there was much dyspnœa, with the signs of œdema of the lungs; the pulse was small, weak, but regular. The emphysematous condition of the lungs interfered somewhat with auscultation of the heart, but it was satisfactorily ascertained that, though the impulse of the heart was strong, yet no abnormal sound existed. The urine was highly albuminous, with a diminished specific gravity. He died soon after coming under observation.

Post-mortem Examination.—Some clear serum was found in the pleural cavities; the lungs were congested and emphysematous; the heart was enormously enlarged; externally it presented the appearances which are generally impressed on the organ by aortic patency; there were the same elongation and increased development of the left ventricle. Impressed with this idea, the aortic valves were tested in the manner described in the last case, but no regurgitation was allowed. On opening the heart, not only the aortic, but all the valves, were found to be perfectly normal. The enlargement of the heart was chiefly due to dilatation with hypertrophy. The left ventricle was principally affected. The walls of this cavity were much thicker than natural, but the size of the cavity was out of proportion even to the thickened walls; dilatation, therefore, predominated. The right ventricle presented the same changes, but in a slighter degree. The tissue of the heart was of healthy consistence. The aorta was extensively diseased; its interior presented almost universally the yellow discoloration produced by atheromatous depositions in the sub-serous tissue. In some places the inner coat was replaced by large patches of bone. In this case, as in the former one, fat was deposited in considerable quantities, not only around internal organs, but also in the subcutaneous tissue. The kidneys were greatly enlarged, and smooth externally, whilst a section exhibited the "fatty degeneration" in an advanced stage of development.

These cases very clearly illustrate the influence of dilata-

tion of the heart as a direct source of obstruction to the circulation, since in both of them the signs of obstruction were very fully developed, and dilatation of the ventricles was the only lesion found.

Cases I. and II. were less conclusive on this point, as in them there was softening in addition to dilatation.

Dilatation of any of the cavities of the heart implies that the amount of pressure exercised on the inner surface of such cavity must have been relatively greater than the power of resistance of its walls. In Cases I. and II., independently of any obstruction to the circulation, the muscular tissue was softened; the muscular power was consequently defective; the pressure from within, although not more than normal, overcame the resistance from without, and dilatation was the result. Many doubt that any considerable degree of enlargement of the heart, can occur independently of valvular disease or of pulmonary obstruction. In the four cases which have now been detailed, however, it existed to a very marked degree, and in the form of dilatation with hypertrophy. In Cases I. and II., as has been already stated, the enlargement of the heart depended on softening of its tissue. In Cases III. and IV. no cause for enlargement was found within the heart itself, but extensive disease existed in the tunics of the aorta, which, it is more than probable, is a sufficient cause for cardiac hypertrophy in general.

How far this condition is to be recognised as capable of producing in all cases the fatal train of morbid changes which has just been described, the writer is unable to affirm, but as it seems almost certain that a direct connexion existed between the pathological conditions and the symptoms recorded in Cases III. and IV., a few observations on the subject may not be inappropriate.

The elasticity of the larger arterial trunks is, by modern physiologists at least, acknowledged to be an efficient auxiliary in carrying on the circulation of the blood. "The elastic arterial wall, stretched by the contraction of the heart, re-acts with

a power which approximates more closely to that by which it was dilated, according as the arterial tissue is more or less elastic. The arteries are thus made to contract upon their contained blood, and to drive it onwards, or from the heart, and backwards, or to the heart. Its course in the latter direction is speedily checked by the sudden and forcible closure of the aortic valves under the pressure of the regurgitating current. Therefore, the great mass of blood rushes onwards towards the capillary system, propelled first by the heart's impulse; and, secondly, by the elastic re-action of the arterial walls"[a].

If the elasticity of the aorta which is here stated to be effective in moving the blood be much impaired, as occurred in Cases III. and IV., we may suppose that the heart is called upon to make unwonted exertions to overcome the *vis inertiæ* of the fluid lying in that vessel. An impediment to the circulation will thus be established, and hypertrophy and enlargement of the heart will result. As the obstruction from the cause assigned becomes greater, the muscular parietes become proportionally thicker. But at last hypertrophy finds its limit, whilst enlargement of the cavities is still progressive. Thus dilatation predominates, and the symptoms of obstructed circulation become fully developed. For when once established, excessive dilatation becomes a direct cause of obstruction. Though the dilated cavities contain much blood, they are able to receive or to expel but little, the heart becomes embarrassed and oppressed, especially when the circulation is hurried; it beats with increased rapidity to compensate for diminished power, and hence arise palpitations with irregularity of action, dyspnœa, hemoptysis, œdema and congestion of the lungs, dropsy, anasarca, and perhaps an interruption of the functions of the brain.

Thus it is, that an excessively dilated heart, by its inefficiency to unload its chambers, produces symptoms similar to those which are the result of obstructive valvular disease.

[a] Todd and Bowman's Physiological Anatomy, Part iv. p. 351.

Section III.—influence of dilatation of the chambers of the heart as a complication of valvular disease.

Since dilatation of the ventricles uncomplicated by any other cardiac lesion may produce the fatal results just mentioned, it will be readily admitted that dilatation may prove a most serious complication in cases of pre-existing valvular disease.

Much variety is observed in the duration of different cases of valvular disease. Some run on to a fatal termination in a very short space of time; others, on the contrary, live for many years, suffering, no doubt, from various distressing symptoms, yet at intervals in the enjoyment of tolerably good health. The difference in the amount of valvular disease in any two cases will rarely suffice to explain this circumstance; for in the case soonest fatal, there may have been the least amount of valvular derangement. The accidental lesions to which the subjects of organic heart disease are so liable, such as pneumonia, bronchitis, or fresh endocardial inflammation, will, no doubt, account for the fatal issue at an early period in many instances. But the great difference in the duration of life in all cases will be more obviously and more easily explained, if it shall appear that, in all organic diseases of the valves or apertures of the heart, the urgency of the symptoms is not so much proportional to the mechanical derangement, as to the changes produced thereby in the capacity or the muscular development of the several cavities.

Again, we are familiar with the fact, that an identity of symptoms is often met with in the advanced stages of different valvular diseases. This apparent anomaly would be easily explained if it should appear that there is a liability for all forms of valvular disease to be ultimately complicated with the same structural changes of the muscular tissue.

Hypertrophy of the muscular parietes of the cavities of the heart is the inevitable result of mechanical obstruction, and owing to it, in such cases, a more equable circulation is main-

tained than could otherwise be hoped for. But with this there is also a tendency to enlargement of cavities, which, so long as it is accompanied by a proportional amount of hypertrophy, may not be productive of inconvenience. As soon, however, as the increased bulk of the muscular wall ceases to be proportional to the increased capacity of the cavity, whenever in fact dilatation is predominant, the cavity enlarging, as it were, at the expense of its walls, then a great aggravation of symptoms is the result. Where the original disease has been valvular inadequacy, the signs of obstruction are superadded, and where the primary lesion has been essentially an obstructive one, the symptoms depending on obstruction all become exasperated.

The following Cases are illustrative of these remarks:

Case V.—*Aortic regurgitant Disease. Excessive Dilatation, with Hypertrophy of the Left Ventricle. Mitral Valve healthy. Signs of obstructed Circulation. Pulmonary Apoplexy, &c.*

Margaret Foy, aged 42, a servant, was admitted into the Whitworth Hospital under my care, February 27, 1850. She had acute rheumatism four years ago, which affected all her joints, and from which she suffered for seven weeks. Last Christmas she caught cold, and then first suffered from palpitation of the heart, and from difficulty of breathing, with severe cough. These symptoms becoming more aggravated, she was compelled to apply for hospital relief.

On admission she had much cough, and the breathlessness of cardiac disease. The least exertion brought on violent palpitation. There was dyspnœa, which was intermittent, usually coming on at night, after she had slept for a little. Sometimes the paroxysm would last all night. During its continuance she was invariably obliged to sit up in bed.

On examining the chest, the heart's action was felt over a large extent of surface, which, with increase of dulness, indicated considerable enlargement of the organ. The usual signs of aortic patency were fully developed. The larger arterial

trunks throbbed violently, and their course was distinctly visible as each vessel was thrown up out of its bed at every beat of the heart. The pulse was jerking and large. A distinct double bellows murmur was heard along the sternal region, but its greatest intensity was over the valves of the aorta, and opposite to where that vessel makes its first curve. The diastolic portion of the murmur was the most intense. Aortic regurgitant disease, with considerable enlargement of the heart, was diagnosed.

Leeches were applied from time to time over the region of the heart, and on one occasion six ounces of blood were abstracted from the arm with marked relief. Morphia and the tincture of lobelia, given at bed-time, materially diminished the severity of the paroxysms of dyspnœa. Ten days afterwards pneumonia attacked the apex of the right lung; it was subdued by appropriate treatment, but from this period the paroxysms of dyspnœa recurred more frequently and with greater urgency. They now assumed much of the characters of angina.

March 15th. Jaundice appeared, and the sputa were tinged with blood. The feet now became anasarcous. Diuretics and diffusible stimulants were directed. For the next fortnight the symptoms underwent but little change, the attacks of angina were occasionally very severe, but the lobelia seldom failed to procure relief. The anasarca increased.

29th. A severe paroxysm of dyspnœa occurred this morning, accompanied by profuse hemoptysis. Free cupping to the chest; diffusible stimulants.

30th. The hemorrhage continues, but the dyspnœa is less urgent.

April 2nd. Dyspnœa of the most urgent kind is present. The face is pale, and the pulse failing. No treatment now afforded even the slightest relief. She continued to suffer intensely, and died after a painful struggle on the morning of the 3rd.

Post-mortem Examination.—Heart greatly enlarged; eccen-

tric hypertrophy of the left ventricle. The capacity of this chamber was enormously increased; the chambers of the right side were also enlarged, and the right auriculo-ventricular opening dilated. The aorta was dilated at and above its origin, its lining membrane was opaque, yellowish, and roughened by fibrinous deposits. The sigmoid valves were of normal size, but thickened, and inadequate to close the mouth of the dilated vessel, as was proved by experiment. The mitral valve was perfect, but the serous membrane which covered it, as well as the endocardial lining of the left auricle, was of a yellowish colour. The lungs presented a remarkable specimen of pulmonary apoplexy. Cirrhosis of the liver and granular degeneration of the kidney likewise existed.

Case VI.—*Aortic Patency. Aortitis. Dilatation of the left Chambers of the Heart, and of the left Auriculo-Ventricular Opening. Signs of Obstruction.*

Michael Connor, aged 30, a porter, was admitted into the Whitworth Hospital, under my care, December 12th, 1850. Three years previously this patient laboured under rheumatic fever, for which he had bean treated by Dr. Corrigan. He recovered perfectly, and remained well until the month of May (seven months before admission), when the first symptoms of heart disease were observed. On admission palpitation of the heart, and breathlessness, were present, whenever he exerted himself even slightly; in addition to which he complained of dyspnœa at night, which used to occur suddenly during sleep, and was paroxysmal. His feet were anarsarcous.

The following physical signs existed at this period. There were extensive cardiac dulness, and a double bellows murmur over the base of the heart and along the sternum. Over the apex of the heart, which had passed considerably towards the left side, a single loud systolic *bruit* was evident.

In a fortnight this patient left the hospital much relieved.

He was re-admitted January 4th, with all his former dis-

tressing symptoms much aggravated. The dyspnœa was most urgent, and the fits of angina at night threatened, at each paroxysm, to terminate his existence. Mr. Hill, the clinical clerk, reporting his condition in one of these seizures, stated, that he found him "labouring under the most intense dyspnœa, which had come on with extreme suddenness; bathed in perspiration; and breathing with the utmost difficulty. He was supported in a sitting posture, with his shoulders raised. The alæ nasi were dilated; the lips blue; the pulse weak, small, and compressible. He complained of excessive pain in the sternal region, and of coldness of his feet and legs."

These paroxysms generally lasted each for three or four hours. The dropsical symptoms had increased, and the signs of pulmonary congestion were very evident.

January 7th.—Breathing very difficult; hands and feet cold; the pulse 132, weak and thready. Pressure on the epigastrium could not be borne. The lower extremities were much swollen, and fluctuation was distinct in the abdomen; the physical signs, as before enumerated, were unaltered. He died two days afterwards.

Post-mortem Examination.—The heart was greatly enlarged; the right cavities were simply dilated. The left presented dilatation with hypertrophy,—but dilatation was the predominant change. Tissue of the heart much softened, so as to be readily torn or broken down. Left auriculo-ventricular opening much dilated. The left auricle, as has been stated, was very capacious, besides which its lining membrane presented a well-marked yellow colour, such as generally indicates that regurgitation has been freely allowed. The mitral valve was healthy. The aortic valves were thickened and shortened, so as to have been altogether incapable of meeting. Aortitis existed to an extraordinary degree; the lining membrane of the aorta was swollen, and presented a villous appearance, with the colour of scarlet cloth; it was likewise soft and pulpy to the touch.

In the lungs blood was found freely extravasated, and the

vessels were yet greatly gorged. The liver presented the "nutmeg" appearance.

Case VII.—*Aortic Patency. Dilatation of the Left Chambers of the Heart, and of the Left Auriculo-Ventricular Opening. Signs of Obstruction. Pulmonary Apoplexy, &c.*

John King, aged 30, was admitted into the Whitworth hospital, under my care, June 13, 1852. He had been complaining for five or six months of vague feelings of ill health, but had no symptoms to lead him to imagine that he had heart disease, until very lately, when his feet became swelled, and his breathing difficult.

On admission there were present general anasarca, and slight ascites; the face was bloated, and the conjunctivæ injected. The breathing was difficult. There was general bronchitis, with congestion of the lower lobes of the lungs. The liver also was enlarged, and projected three fingers' breadth below the ribs. The pulse was thrilling, full but soft; much softer than in cases of uncomplicated aortic patency. Visible pulsation of the larger arteries was observed, and turgescence of the jugular veins.

The heart beat over a large surface, but its impulse was not immoderate. The cardiac region was extremely dull, and a loud double *bruit*—a *bruit de scie*—heard over a large surface, but with greatest intensity over the sternum, indicated aortic regurgitation. The urine was scanty, and not albuminous.

Local depletion, diuretics, and diuretic purgatives were prescribed with much advantage, but the dropsical symptoms could not be wholly got rid of. No material change otherwise occurred until July 20, when he began to spit up blood. A frightful paroxysm of dyspnœa occurred that night, which obliged him to stand for hours at an open window. Next day he was greatly sunk, and partially jaundiced. The extremities were cold and greatly swollen. The liver was tumid and tender. Hemoptysis continued.

21st. The dyspnœa during the night was extreme, and

occurred in paroxysms. This morning he was quite unable to lie down. He sank rapidly, and died that night during a violent convulsion.

Post-mortem Examination.—The heart was greatly enlarged; weight twenty-five ounces; the aorta was dilated; the sigmoid valves thickened, and their pliancy diminished; but their inadequacy was mainly owing to dilatation of the vessel. There were patches of lymph in the left auricle, and also in the left ventricle. The latter cavity was much enlarged, and its walls hypertrophied. The mitral orifice was greatly dilated. The mitral valve was healthy. The tissue of the heart was abnormally soft; right cavities enlarged, without corresponding hypertrophy; right auriculo-ventricular opening greatly dilated.

Blood was extravasated in small quantity under the external serous membrane of the ventricles from the rupture of a small venous branch. There were the traces of old pericarditis, which had not terminated in adhesion, for lymph in patches of considerable size was found on the exterior of the auricles. Pulmonary apoplexy existed in the right lung, and pneumonia in the left.

In the three cases last detailed, the primary lesion was valvular inadequacy, in which the signs of an obstructed circulation do not necessarily exist; yet dropsy, engorgement of the right side of the heart, pulmonary hemorrhage, and hepatic congestion, were, in these instances, as fully developed as they would be in cases of obstructive valvular disease. To what, then, are we to refer these symptoms, since the mechanical derangement of the valves is insufficient to account for them? That they depended chiefly, if not altogether, on excessive dilatation of the ventricles, with which softening was combined in Case VII., is more than probable; and the writer is the more inclined to adopt this opinion from having, in so many instances, found dilatation alone, that is, uncomplicated with valvular disease, capable of developing all these symptoms in

the highest degree. (Cases I., II., III., and IV. were examples of this.)

These cases of aortic inadequacy were, towards their close, accompanied by symptoms usually found where contraction of the left auriculo-ventricular opening has existed. This illustrates the observation already made, "that *dissimilar valvular diseases* are liable to be attended ultimately with the *same symptoms*," because there is, in all of them, a tendency to the development of the same changes in the muscular tissue of the ventricles.

In the subjects of aortic patency, death generally results from a failure of the muscular power of the heart; and the great principle to be observed in their treatment, as has been clearly pointed out by Dr. Corrigan, is to seek to avert, by such stimulants as may be suitable to each individual case, this tendency of the disease, whilst at the same time local congestions are to be relieved by suitable depletion. But where aortic patency is complicated with excessive dilatation, it would appear, from the preceding cases, that death is rather the result of apnœa. Angina, more or less modified, was present in all these cases. In Case VI. aortitis existed in a well-marked degree; but in Cases V. and VII. extreme dilatation of the heart was the only probable source of this distressing complication.

Herein we see contrasted the effects of hypertrophy and of passive dilatation. In aortic patency, the hypertrophy of the left ventricle, so invariably associated with that lesion, has been well called "conservative"[a]; for so long as no farther

[a] By this expression, as I believe, is generally understood that, as the function of the aortic valves is annulled by their inability or insufficiency to meet behind the blood, the left ventricle is called upon not only to propel the blood by its systolic contraction, but, during the diastole of the heart, to support the column of blood in the aorta as the valves do in health. Hence hypertrophy is developed. But I apprehend it may be understood to mean more than this. When the aortic valves have become inadequate the influence of the elastic power of the aorta in propelling the mass of blood is more or less diminished, because the resistance of the valves behind

change occurs, little distress, comparatively speaking, is experienced; but as dilatation supervenes, the force of contraction of the ventricle is gradually weakened, the benefits of augmented muscular power are counteracted, and an obstructed circulation, with all the symptoms which invariably attend it, are ushered in.

As aortic patency, when uncomplicated, produces no obstruction to the circulation, so, in like manner, of mitral patency—mitral regurgitant disease. As a sequel of rheumatic endocarditis, mitral patency is very common. It may exist for years without producing much inconvenience. To illustrate the phenomena of mitral regurgitation, and to contrast them with the symptoms developed at a later period, when dilatation has been superadded, the following case, at present under observation, may be briefly narrated:—

Case VIII.—*Mitral Patency. Hypertrophy of the Heart. Signs of Obstruction wanting.*

Maria Benson, aged 15, was admitted into the Whitworth Hospital under my care, June 28, 1852. After a severe wetting in September last this young girl was attacked with acute rheumatism in a very severe form. For four weeks she was confined to bed; after this, and even when able to walk about, she was not free from a certain amount of swelling and deformity of the joints; in December the disease was yet lingering in a subacute form. Under the use of the iodide of potassium the rheumatic affection was completely removed, and she quickly regained health and strength. At this period she became liable to palpitation of the heart, and was conscious of the unusually violent action of that organ. Being of an extremely uncom-

is essential to enable the elastic pressure of the artery to urge the fluid onwards (*vide* page 368). Hypertrophy of the left ventricle, therefore, is necessary to compensate for the loss of this important auxiliary in moving the blood. For this twofold reason the hypertrophy which attends aortic patency is always excessive, and as it enables the circulation to be carried on with more efficiency than otherwise, it has been aptly termed "conservative."

plaining disposition, she did not mention this for some months afterwards, when she grew alarmed at the continued force of the heart's action. At present she has all the appearances of robust health, being large and well formed for her age; her appetite is good; she sleeps well; she makes no complaint except of the force with which the heart beats, and suffers from palpitations only on making any unwonted exertion.

The impulse of the heart is very strong and can be felt over a large space. The parietes of the chest are visibly displaced by the violent propulsion of the organ; there is an increase in the extent of cardiac dulness, indicating considerable enlargement of the heart; the force of the impulse denotes that this is due to hypertrophy; a loud prolonged systolic bellows murmur heard over the region of the apex, which lies to the left of its usual position, denotes free mitral regurgitation; over the sternal region the sounds of the heart are heard unaccompanied by any abnormal murmur; between the spine and the vertebral border of the left scapula a single *bruit* can be distinguished. The pulse is quick, ranging from 110 to 120; its volume is disproportionate to the force of the heart's impulse. There has been no pulmonary hemorrhage or œdema of the feet. The signs of obstruction are wholly wanting.

July 20th. This case has now been for about three weeks under treatment. The force and rapidity of the heart's action have been considerably diminished by the careful use of digitalis, with mild aperients, and by maintaining mind and body free, as far as possible, from any over-excitement.

Cases such as the preceding will be familiar to every practitioner as a sequence of acute rheumatic endocarditis. The symptoms present a striking contrast to those which are developed when excessive dilatation of the ventricles has been superadded, which still further corroborates the remarks which have been already made on the influence of dilatation, especially when softening is superadded, in causing obstruction of the circulation.

The following case from Dr. Hope's work furnishes this contrast[a].

Case IX.—*Mitral Regurgitation. Dilatation with Hypertrophy. Signs of Obstruction.*

"Elizabeth Dennis, aged 50. Admitted into St. George's Infirmary under Sir J. Clarke, December 9th, 1830, affected with *all the symptoms of organic disease of the heart in their most severe form.* Has been affected with ascites and anasarca. Bellows murmur accompanying the first sound below the middle of the heart, but not in the region of the aortic valves; impulse strong. Pulse irregular, unequal, and extremely feeble, later than the ventricular systole.

"*Autopsy.*—Hypertrophy and dilatation of the heart; all the valves healthy except the mitral, the free margin of which was thickened by fibro-cartilage, and the chordæ tendineæ were shortened in such a manner as not to allow the layers of the valve to come into apposition, hence a space judged to be about as large as a finger was left, through which regurgitation would take place."

The next case not only illustrates the influence of dilatation in producing the phenomena of obstruction, but also the effects of mitral regurgitation, and of a dilated heart, on the nervous centres.

Case X.—*Mitral Regurgitation. Dilatation of the Left Auriculo-ventricular Opening. Rupture of the Chordæ Tendineæ. Dilatation of the Heart. Signs of Obstruction. Softening of the Brain.*

Anne Connor, aged 30, was admitted into the Whitworth Hospital, under the care of Dr. Banks, November 10, 1848.

For six months previously the unequivocal symptoms of heart disease had existed. Menstruation had been irregular for three months. Since then she frequently complained of a sensation of weight in her head, dimness of sight, with great

[a] Dr. Hope on Diseases of the Heart. Third Edition, p. 573.

depression of spirits, to which was superadded an uncertain and tottering gait. Symptoms of hemiplegia then became developed. On awaking one morning her tongue felt swollen, and she was unable to articulate distinctly. In twenty-four hours there was complete paralysis of the left side.

This patient left the hospital in a fortnight, and was readmitted three weeks afterwards, under my care. The prominent symptoms in the case remained unaltered. The left side was hemiplegic, without any diminution of the ordinary tactile sensibility of the surface. General dropsy had supervened. There was dyspnœa from congestion of the lungs; the face was bloated; the pulse small and frequent. She died two days after her return to hospital.

Autopsy[a].—The heart was considerably enlarged, especially its systemic portion; the left auricle presented a remarkably capacious cavity, with thickened walls; in its interior was found distinct evidence of previous endocardial inflammation, for on the free surface of its lining membrane a patch of rough, granular lymph was deposited. This extended into the left auriculo-ventricular opening, and implicated the mitral valve.

This valve was found thickened, its edges rough and irregular, whilst several of its chordæ tendineæ were ruptured.

The left auriculo-ventricular opening was rather larger than natural; the left ventricle presented a dilated cavity, whilst its walls were diminished in thickness; the aortic valves were healthy.

In the heart it appeared, therefore, that every condition existed to allow of regurgitation through the left auriculo-ventricular opening. The lungs were very much congested, but were otherwise healthy.

The morbid condition of the brain was exactly limited to the corpus striatum on the right side, the interior of which was extensively softened. The remainder of the brain was perfectly healthy, and no traces of inflammatory action, either

[a] Published in Reports of the Pathological Society, January 13th, 1849.

of the brain or of its membranes, could be detected (*exsanguineous ramollissement*).

In this case, death occurred so soon after admission that there were not opportunities sufficient for carefully analyzing the physical signs. The symptoms of a lesion of the nervous system were predominant, but from the history of the case, which stated the previous existence of the symptoms of heart disease, together with the existence of general dropsy, and a loud bellows murmur over the heart, the conclusion was arrived at, that the heart was the organ primarily engaged, and that the lesion of the brain was consecutive to, and depended on, it.

This case furnishes another instance of the phenomena of an obstructed circulation as associated with dilatation of the left chambers of the heart, and of the left auriculo-ventricular opening.

It has been stated that cerebral lesions, in cardiac disease, are not peculiar to mitral contraction. In the case last recorded, extensive softening of the brain accompanied an opposite condition of the heart. But the explanation is not difficult. "The imperfect condition of the mitral valve (the result of endocarditis and subsequent rupture of some of its tendinous cords) induced 'permanent patency' of the left auriculo-ventricular opening. The lungs, no longer protected by the mitral valve, as they are in health, were gorged by the refluent blood of the left ventricle, whilst the system at large was proportionally deprived of its due supply of arterial blood: and in this instance, as in other similar ones, as also in cases of large aortic aneurism, some part of the grey substance of the brain, which so especially requires a large amount of red blood for the due performance of its functions, was found in a state of *ramollissement.* A contracted state of the left auriculo-ventricular opening, by obstructing the flow of the blood into the left ventricle, would induce the same morbid changes in the brain equally with a permanently patent condition of the same opening; for in each case the effect is the same—a dimi-

nution in the energy and efficiency of the systemic circulation"[a].

In those cases, and they are of very frequent occurrence, in which cardiac and renal disease co-exist, there is an obvious and a direct cause for a diminution in tone of the muscular fibre. It is now universally admitted, that with degeneration of the kidneys there is a diseased condition of blood (it matters not with reference to the present question, whether this depravation of the fluids *preceded*, or was the *consequence* of the renal unsoundness), and when the elements of nutrition are diseased, the heart, for obvious reasons, must be early affected. In some of the preceding cases disease of the kidneys existed, and, no doubt, exerted a direct influence on the cardiac affection (Cases iv., v.). It is unnecessary, however, that I should do more than allude to this subject here; it has been fully illustrated by the genius and researches of Dr. Bright, who first opened up an extensive field of inquiry, which has since been extended by the labours of many talented observers.

I have thus dwelt much on dilatation of the heart as a direct cause of obstruction to the circulation. It occurs under a great number of circumstances, which, if traced back to their primary source, may be reduced, probably, to three varieties:—

1. Mechanical obstruction may be the proximate cause of dilatation, which is then generally combined with hypertrophy. The several forms of valvular disease furnish numerous examples of this class (Cases v., vi., vii.), to which must be added, obstructions in the aorta. A loss of elasticity from disease of the coats of this vessel I have shown, in two instances, to be capable of producing dilatation of the heart equally with valvular disease (Cases iii. and iv.).

2. The muscular tissue may yield to the pressure from within, owing to inflammation of the substance of the heart, either acute or chronic: carditis is a generally admitted cause of softening.

[a] Pathological Reports, as cited above.

3. Dilatation may exist, and yet be less a local disease than the result of deficient or depraved nutrition, as occurs in the different forms of "Bright's disease" of the kidney. In such cases, valvular disease is often co-existent; but, on the other hand, there may be no other evidence of disease in the heart than excessive enlargement. Dilatation, which will then be the *primary cardiac* affection, is, after all, in such instances, but *secondary to renal disorganization.*

The following are some of the more important inferences deducible from the preceding observations:—

1. Excessive dilatation of the ventricles of the heart is a direct and an efficient cause of obstruction of the circulation.

2. It contrasts, in this respect, with hypertrophy, the benefits of which latter condition in valvular disease are often subsequently counteracted by progressive dilatation.

3. Dilatation may exist independently of diseased valves, and may produce the general symptoms of obstructive valvular disease, or when accompanied by softening, it may develop the signs which specially indicate mitral contraction.

4. Dilatation may occur as a complication of all forms of valvular disease, modifying their signs, and producing an identity in the final symptoms of dissimilar diseases.

5. Hence, in valvular diseases not essentially obstructive, when dilatation is superadded, the signs of obstruction become developed. The occurrence of pulmonary apoplexy, and other phenomena of an obstructed circulation in aortic patency, may thus in general be explained.

6. Atheromatous disease of the aorta causes obstruction from the loss of elasticity of the vessel. Enlargement of the heart may thus be induced, which, as dilatation becomes established, proves fatal, though the valves of the heart are free from disease.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Sixth Annual Report of the Commissioners in Lunacy to the Lord Chancellor, 30th June, 1851. Ordered by the House of Commons to be printed, 8th August, 1851.

Insanity, its Causes, Prevention, and Cure. By Joseph Williams, M. D. Second Edition. London: Churchill. 1852. Royal 12mo, pp. 317.

Remarks on the Plea of Insanity, and on the Management of Criminal Lunatics. By William Wood, M. D. London: Longman and Co. 1851. 8vo, pp. 70.

On Improving the Condition of the Insane. By H. Monro, M. B. London: Churchill. 1851. Parts I. and II. Pamphlet, pp. 23 and 14.

The Journal of Psychological Medicine and Mental Pathology. Edited by Forbes Winslow, M.D. London: Churchill. Nos. 16, 17, 18, and 19.

Observations upon the Importance of Public Hospitals for the Insane of the Middle and Higher Classes. By Thomas Dickson, L.R.C.S. Edinb. London: Churchill. 1852. Pamphlet, pp. 62.

The American Journal of Insanity. Edited by the Officers of the New York State Asylum. July, 1852.

Transactions of the Association of Medical Officers of Hospitals for the Insane in Great Britain and Ireland. 1852. Pamphlet, pp. 12.

Nineteenth Annual Report of the Carlow District Hospital for the Insane, to 31st March, 1852. By M. E. White, A. M., M. D., Resident Physician. Pamphlet, pp. 28.

Nineteenth Annual Report of the Maryborough District Lunatic Asylum, to 31st March, 1852. By T. C. Burton, M. D., Resident Physician. Folio, pp. 3.

Twenty-Second Annual Report of the Belfast District Asylum for the Insane Poor, to 31st March, 1852. By Robert Stewart, M. D., Resident Physician. Pamphlet, pp. 23.

Middlesex January General Quarter Sessions, 1852. *The Final Report of the Committee appointed to provide an additional Pauper Lunatic Asylum, with the Reports of the Resident Physicians,* Drs. Hood and Davey. Pamphlet, pp. 94.

Fourteenth Annual Report of the Suffolk County Lunatic Asylum, for 1851. By John Kirkman, M. D., Resident Physician. pp. 29.

Report of the Manchester Royal Lunatic Asylum, in connexion with the Manchester Royal Infirmary. 1851.

Fourth Annual Report of Somerset County Lunatic Asylum. 1851. By Robert Boyd, M. D., Physician and Superintendent. pp. 50.

Annual Report of the Aberdeen Lunatic Asylum. 1852. By D. C. Campbell, M. D., Resident Physician and Superintendent. pp. 21.

Twelfth Annual Report of the Crichton Royal Institution for Lunatics. 1851. By W. A. F. Browne, M. D., Resident Physician. pp. 40.

First Annual Report of Wilts County Lunatic Asylum. 1851. By J. Thurnam, M. D., Resident Physician and Superintendent. pp. 44.

Articles on Reform in Private Asylums. By H. Monro, M. B. London: Churchill. 1852. 8vo, pp. 87 and 23.

Eighth Annual Report of the New York State Lunatic Asylum. 1851. By N. D. Benedict, M. D., Physician-Superintendent. Pamphlet, pp. 62.

Études Cliniques. Traité Théorique et Pratique des Maladies Mentales, considérées dans leur Nature, leur Traitement et dans leur rapport avec la Médecine Légale des Aliénés. Par M. Morel, Médecin en chef de l'Asile d'Aliénés de Maréville, &c. Tome premier. Nancy: Raybois. Paris, Masson. 1852. 8vo, pp. 471. With 14 Engravings.

The progress now being made towards the amelioration of the condition of the insane in these countries, and the active spirit which is so evidently at work with the view of bringing every

means and appliance into operation for the benefit of this class of sufferers, are circumstances which of themselves would alone be sufficient to distinguish our land for all that is ennobling, and of stamping it with the seal of true Christian feeling and virtue. To aid and cheer on in this praiseworthy work is to us a most pleasing duty; and in now again resuming our annual undertaking of bringing before the profession a short detail of what has been doing during the last twelve months in this department of medicine, our earnest desire shall be to do strict justice to those who have been zealously labouring in a cause at once honourable and important. But here we feel called upon to say, that we have not been aided, as we might reasonably expect, in our endeavours to advance the interests of the insane, and disseminate whatever improvements may have been adopted in their treatment by those who are in immediate charge of our public asylums, for their Annual Reports have been very sparingly supplied to us; this we can look upon in no other light than as a dereliction of duty to the medical community in particular, and one not calculated to promote the interests of establishments whose responsible officers, it is our desire to show from official documents, are alive to the welfare of their patients. In proof that we have full grounds for making this reference to a charge of neglect or inattention on the part of the superintendents of hospitals for the insane, we may mention, that in Ireland there are eleven district asylums, from only three of which have Reports been forwarded to us, viz., those of Maryborough, Carlow, and Belfast. In the sister country there are more than thirty county and borough asylums in operation, and yet but from four have we gotten such documents; and lastly, in Scotland there are seven, and not more than two Reports from amongst them have been presented to us. We have but to hope that the hint we have now given will be taken in good part, and that no occasion will arise to refer to it on a future occasion.

The last issued Annual Report of the Commissioners in Lunacy (the sixth) brings the state of public hospitals for the insane, and private asylums in England, down to the 30th of June, 1851. Now, although we give to the English Commissioners every credit for zeal and ability in the fulfilment of their responsible duties as elaborated in the official paper before us, yet we think they might, with much benefit, turn to the Parliamentary Reports of the Commissioners of similar establishments in Ireland, and take a leaf out of their Report, which would greatly add to the value and usefulness of their own.

For instance, we cannot find from beginning to end any fiscal statement whatever of the English County Asylums, which we look upon as a considerable want. The Irish Reports give particulars in this way most minutely, perhaps a little too much so, but better this than none at all. We are, however, left completely in the dark as far as regards the outlay of money in England in connexion with its public asylums, and why this should be we cannot possibly understand. Another serious defect in this Report of the Commissioners is, that no tables or other statements of the result of treatment in the several public and private asylums coming under their official superintendence are afforded. If one item of information more than another is of greater importance, we conceive that it is this, and however disagreeable it may be to make comparisons, we must in all truth affirm, that our own Commissioners' Reports, on this point especially, bear a marked contrast to those of their English brethren, inasmuch as the fullest and most satisfactory statistics are given in them of both our district and private asylums, as curative institutions for the insane; and we therefore would strongly recommend the English Commissioners to adopt them as models of the most perfect kind to follow. In several other matters of detail also, such as the dietaries of the respective asylums, the names of visiting magistrates and officers, &c. &c., the Report for England is entirely silent, but on all which the same documents for Ireland invariably contain every requisite information,—information too, be it observed, which the public naturally look for and expect, and without which a Report of this peculiar kind is very incomplete and defective. We are sure, however, that it is only necessary to call attention to these matters, in order that hereafter they may not be altogether overlooked. The first point which strikes us as worthy of notice in this Report is the following extract, referring to a prosecution instituted by the Commissioners, which we give *in extenso*, deeming it both interesting and important:—

"A pauper of the name of Moses James Barnes was admitted as a lunatic patient into Perkham House in March, 1850. In December of the same year it appeared that he was resident in the Infirmary, and was under the care of Samuel Hill, one of the attendants. On the evening of the Monday next before Christmas Day, the patient refused to go to bed, and Hill, the attendant, laid hold of him and threw him violently on the floor, the consequence of which was, that one of the arms and four of the ribs of the patient were broken. The violent conduct of Hill was witnessed by a patient named Richard Donnelly, but no serious consequences being apprehended at the time, Donnelly did not tender any information on the subject, and the patient Barnes himself was, by reason of his insanity, scarcely in a

condition to make it a matter of complaint. It was evident that Hill must have known that Barnes' arm had been injured, inasmuch as he was unable to move it; but he made no mention of the fact till the following Friday, when he showed the arm to the head attendant of the ward, who brought the case under the notice of the medical officer of the asylum. Surgical assistance was immediately afforded to the patient, and a statement of the facts transmitted to our Board, who thereupon authorized two of its members forthwith to investigate the matter. The patient himself lingered until the 2nd of January last, when he died; an inquest was held upon the body, and subsequently a post-mortem examination took place, when the fractures of the arms and ribs were discovered,—an eminent surgeon (whom we had instructed to assist at such examination) stating it to be his decided opinion, that the death of the patient was entirely owing to the injuries that he had received! Under these circumstances, we instituted a prosecution against Samuel Hill, who was thereupon tried at the Central Criminal Court at the last February Sessions, and found guilty of manslaughter. As, however, Hill had been convicted mainly upon the evidence of Donnelly, a lunatic, judgment was postponed in order that the opinion of the Judges might be taken as to the admissibility of his evidence. This question was subsequently argued at great length before five of the Judges, when the evidence of Donnelly was held to have been properly admitted, and the conviction was affirmed; eventually, Samuel Hill was sentenced to twelve months' imprisonment. The decision of the Judges on this point is most important; it appeared in the course of the trial, from medical testimony, that Donnelly, the witness, laboured under a delusion that he had spirits in his head, but that he was quite capable of giving a rational account of any transaction that passed before his eyes, and that, except as respected his delusion, he was always rational; the opinions of the Judges were, therefore, that he was a proper witness. In the words of the Lord Chief Justice Campbell,—'The proper test must always be, does the lunatic understand what he is saying, and does he understand the obligation of an oath? The lunatic may be examined himself, that his state of mind may be discovered, and witnesses may be adduced to show in what state of sanity or insanity he actually is; still, if he can stand the test proposed, the jury must determine all the rest. In a lunatic asylum the patients are often the only witnesses to outrages upon themselves and others; and there would be impunity for offences committed in such places, if the only persons who could give information were not to be heard.' And this opinion was concurred in by the other Judges, one of whom (Mr. Baron Alderson) said, 'I quite agree that it is for the Judge to say whether the person called as a witness understands the sanction of an oath, and for the Jury to say whether they believe his evidence. Here the account of the lunatic himself, and the evidence of the medical witnesses, show that he was properly received as a witness.' In citing authorities having reference to the point in argument, an important

case (*Rex* v. *Morley*) was quoted, in which Mr. Baron Parke admitted a witness proved to be, to a certain extent, insane; and also another, in which Mr. Baron Hullock admitted as a witness a surgeon who had been acquitted of a crime on the ground of insanity, and was then in confinement. The point may now be considered as finally settled."

Two other cases are also given of prosecutions instituted by the Commissioners: one for signing a medical certificate without examining the patient, but in which proceedings were stayed, the parties not appearing to have acted from corrupt motives; the third was that of the proprietor and the medical attendant of a licensed house in the county of Kent, who were indicted for false entries in their medical journal, and concealment of restraint, when, the defendants having pleaded guilty, the proprietor was fined by the Court in two several sums of £50 each, and the medical attendant in the sum of £50, for their offences respectively against the statute. This latter case was the more remarkable, by reason of the convicted proprietor (who subsequently was refused a renewal of his license) having, by the aid of advertisements and public announcements, enjoyed a considerable reputation for carrying on his asylum without any mechanical restraint whatever, though restraint was extensively and almost constantly in use in his house. So much for the vaunted system of *total* non-restraint!

On the subject of criminal lunatics being confined in ordinary asylums, the following very just remarks are made, and in giving them we must express our great surprise that Government should not have taken proper steps before this to establish a central asylum in England for this class, in the same way as has been so satisfactorily done in this country; and on which subject it occurs to us that the present Lord Chancellor of England, under whose auspices, when holding the seals for Ireland, the central asylum at Dundrum was established by an Act of Parliament passed in 1845, could materially help in obtaining such a desideratum, and doubtless he will not fail, we feel assured, in affording the benefit of his assistance in so righteous a cause.

"We cannot allow this opportunity to pass without repeating the strong objections which, in common with the visiting justices and superintendents of asylums, we entertain, and have frequently expressed, both in our previous Report and in communications with the Home Office, to the committal of criminal lunatics to asylums not appropriated exclusively to them, and to their confinement and association with the ordinary inmates of those institutions. The subject is well deserving the early attention of the Legislature, which has already made special provisions for this class of patients in Ireland."

The following is a summary of the number of insane in England and Wales up to the period of this Report:—

	Males.	Females.	Total.
In county asylums, &c., as paupers, ...	5,492	6,567	12,059
In private asylums, . .	2,351	2,046	4,397

Total lunatics of both sexes in public and private asylums, 16,456.

The number of criminal lunatics in England, embraced in the above gross amount, is as follows, viz.:—

Males.	Females.	Total.
314	73	387

The Report shows that 13 county asylums were then in progress of erection for the accommodation of 4299 patients; and that five counties, viz., Cumberland, Durham, Northampton, Sussex, and Westmoreland, had taken no steps towards providing asylums for their pauper lunatics.

The Report concludes with official statements of special visitations made by two of the Commissioners to Parkhouse Idiot Asylum at Highgate, and Essex Hall, Colchester, respectively, both of which institutions would appear to be most satisfactorily fulfilling their important purposes. The Parkhouse asylum contained 72 pupils, 58 being males, and 14 females. 2 pay one hundred guineas; 20, fifty guineas; and 50, twenty-five guineas, each, for their board and lodging. 3 or 4 are so old as twenty-four or twenty-five years of age, and a large number varying between sixteen and twenty-two years, the remainder being of ages from four to fifteen years. Essex Hall contained 66 inmates, of whom 42 were males, and 24 females; the oldest pupil being twenty-one, and the youngest four and a half years old; the rest being of various ages, ranging between five and sixteen years. The pupils in both institutions receive regular instruction in reading, writing, drawing, geography, and arithmetic. The females are regularly taught needlework; but 3 only amongst them were of general use in the establishment; so many as 13, however, were occupied in sewing, knitting, netting, and fancy work. In general the boys are stated to be fonder of play, and more easily trained to cleanliness and activity in their habits than the girls, who are found to be more inert and apathetic, and less easily roused to exertion. With the above analysis, we close our review of this Report of the Commissioners, which, on the whole, is a valuable official document, but could be made much more so by adopting our suggestions, to which we hope a willing ear will be given.

Dr. Williams, the author of a recently published volume on "Insanity, its Causes, Prevention, and Cure," now before us for review, obtained Sir Edward Sugden's prize, awarded by the President and Fellows of the King and Queen's College of Physicians in Ireland, in 1845, for an essay on the use of Narcotics, and other remedial agents calculated to produce sleep in the treatment of insanity. His present publication would from the title-page appear to be but a "second edition" of this "prize essay;" it is not so however, for dovetailed on it is a preliminary dissertation occupying 200 pages, entitled, "Reflections and Observations on Insanity; Causes of Insanity; Classification; Treatment of Insanity;" and then, lastly, comes the "prize" production itself. Such, then, is this by-the-way second edition, and whether so terming it has been a strictly honest proceeding or not on the part of Dr. Williams, we must leave to the profession to judge. We, as in duty obliged, have read Dr. Williams' *soi-disant prize-book* with attention, and though we undertook the task with every disposition and desire to be instructed, yet we have to confess our profit was infinitesimally small in that respect; still, he has evidently bestowed much labour in *collecting* together material for this treatise, and if he has not added to his own laurels, he at least has supplied another volume to the literature of insanity. Our author throughout his book loses no opportunity of making asylums, as such, appear in the worst light: for instance, in discoursing upon the suicidal propensity amongst the insane, he states, "that more suicidal cases occur amongst paupers than among private patients:" a statement which we consider utterly untenable; and, as a reason for this, observes: "It is probable that the absence of moral education, the wretched accommodation, and the more unsightly appearance of the cells and iron bars, may have had some influence in increasing the propensity amongst paupers." We challenge Dr. Williams to inform us where the public asylums now are in which "wretched accommodation, unsightly cells, and iron bars," are to be met with; we have ourselves visited the principal asylums in these countries, and in none did we observe anything of this description. It is in truth a calumny—a gross and deliberate calumny—on those most creditably and humanely conducted institutions, and some explanation, if not apology, is loudly called for on the subject from Dr. Williams. Again, we have exaggeration, such as the following: "How dreadful for a patient just becoming conscious, with reason dawning upon him, to find himself in a madhouse! to hear the dreadful ravings, to see the grotesque exhibitions, to be greeted by the idiotic laugh!—are not these

sufficient to confirm his mental malady?" No doubt, if such existed,—but we emphatically deny that in any ordinarily well-regulated house, private or public, such a state of things had an existence, except in our author's imagination. Here is another extract of the same stamp:—

"I am equally certain that confinement in a madhouse" [a vulgar and sneering term of the writer, which with that of "madmen," disfigures almost every page] "is often apt to render chronic those symptoms which would otherwise be only temporary, and I would never send a person to an asylum, when he could afford to live out of it, unless he was dangerous to himself or to others, and not even then except when the symptoms had become chronic, the disease confirmed."

And worse than all is the annexed quotation, which really astounded us to find deliberately given as a correct statement of facts, whereas in all our experience and extended acquaintance with the details of management of hospitals for the insane, we never knew or heard of a single instance of the immediate attendants—a title which we prefer much to Dr. Williams' obsolete one of "keepers"—upon the insane becoming the subjects of the disease themselves,—an experience in which we feel quite satisfied the medical officers of asylums generally would concur: "How powerful is the effect produced on those who habitually associate with the insane! How many keepers, both male and female, become insane!"

The intelligent and excellent medical officers of establishments for the insane, as well as the establishments themselves, come in for a share of Dr. Williams' *commendation* in such exceedingly polite and complimentary terms as follow:—

"Disease of the mind is complicated, and the persons who have specially undertaken to cure that disease have, at present, individually done very little in the way of suggesting either therapeutical, moral, or general means for alleviating or curing such an afflictive disorder, and this, too, with ample means of investigation before them: the desire has always been to keep the system or plan of treatment 'close.' Even to this day their practice is often secret—empirical."

After this we have only to observe that a veritable Daniel is come to judgment, in the person of the prize essayist, Dr. Williams, and that the members of the profession specially engaged in the treatment of insanity must feel under many obligations to him for deliberately writing them down as nothing short of arrant quacks and empirics; but dispraise is, in our estimation, much more to be desired than praise from such a

source. Before closing our notice of this singular book on "madhouses and madmen," we must not omit to give a specimen of the author's extreme *accuracy* as regards those of the former, as he in his good taste terms them, that are now in operation. Here it is:—

"Turn to the deplorable condition of the insane in North and South Wales, where the unfortunate pauper lunatics are shamefully neglected. In North Wales there is not a single public or private asylum, the lunatics being *imperfectly* and *badly* boarded out, their worst cases being sent to the Liverpool Asylum, the Governor of which states, that he never remembers an instance of recovery in an insane pauper from Wales."

The date of the publication of this work of Dr. Williams is 1852, and, strange to say, in our Journal for November, 1851[a], we reviewed the Second Annual Report, being for the year 1850, of the North Wales Lunatic Asylum at Denbigh, an institution which is set apart for both private and pauper patients in that portion of the principality. And further, in the last (the sixth) Annual Report of the Commissioners in Lunacy, with which we have opened this review, we find the following statement at page 30:—

"Appendix (B) No. 1. *Asylums existing prior to passing of Act* 8 & 9 Vict., c. 109.—Wales: Haverfordwest Town and County, 40. Montgomery and Salop, 238.

"Appendix (B) No. 4. *Asylums in progress of erection under Act* 8 & 9 Vict., c. 126, *and not yet opened:*—Cardigan, Caermarthen, Glamorgan, and Pembroke, 300 (paupers)."

With this defence of North and South Wales from the charge brought against them for their "deplorable condition" in not providing suitable accommodation for the insane portion of the principality, we dismiss all further observations "On Insanity, by Joseph Williams, M. D."

The "Remarks on the plea of insanity and on the management of criminal lunatics," by Dr. Wood, Medical Officer of Bethlem Hospital, has been well received by the profession. The author's position gave him peculiar advantages for writing on a subject which of late has been attracting much attention, and relative to which legislation in the sister kingdom is imperatively demanded.

Dr. Wood bears his testimony, in the most decided manner, to the great impropriety of mixing up, indiscriminately,

[a] Vol. xii. N. S. p. 416.

inmates guilty of crimes of more or less magnitude with other patients in hospitals for the insane: on this head he very pertinently observes, that they (the criminal class)—

"Increase the difficulty in the management of the asylum by the greater restrictions necessarily imposed upon them, for the purpose of safe custody, being unavoidably shared by all the other patients with whom they are associated. The previous character and habits of many of those called criminal lunatics also afford a very strong argument against the practice of exposing to their contaminating influence those who have hitherto been strangers to vice and immorality."

This, we conceive, is putting the point at issue in its true colours, and showing in a few words the "magnitude of the evil, and the necessity of some revision of the law."

Further on he proposes:—

"That criminal lunatics, improperly so called" [and we agree with him that the term is objectionable], "ought to be divided into distinct classes: for instance, insane convicts and state patients, these being an intermediate class, composed of those who have committed offences while labouring under so trifling an amount of mental disturbance as not to entitle them to be considered irresponsible, and yet offences not sufficiently grave to merit confinement. All classes of what are called criminal lunatics have a right to the best means of treatment, and the adoption of such arrangements as afford them the best prospect of restoration to reason; but in rendering them this act of justice, there is no necessity to huddle together all the very different classes without any regard to their previous position in society, the nature of their offence, the degree of moral guilt properly attaching to them, or the amount of mental disturbance under which they labour."

The above views of so experienced and competent a person as Dr. Wood are entirely to our mind, and of the utmost value at the present time. On the whole, we quite agree with the sentiments put forth in these "Remarks," which are sensible and judicious, and well worthy of the best attention, besides doing great credit to their author, Dr. Wood, who has fulfilled his part on a subject of much public moment in a very unassuming and able manner.

Dr. Henry Monro's two pamphlets, "On Improving the Condition of the Insane," being republications from the Psychological Journal and the London Medical Gazette, respectively we need not here more particularly allude to, than merely to say, that their contents show great attention to most important matters in our social economy; and that, as respects

the object of the first pamphlet, namely, the necessity of "establishing public asylums for the middle classes," we concur most heartily with Dr. Monro, and give him every praise for his able advocacy on a subject to which we ourselves have already in former reviews called attention, and which we are rejoiced to see our author has taken up and discussed on the present occasion with so much effect and ability. Dr. Monro's second republished article has reference specially to private asylums, which he endeavours to show might be greatly improved by an increased inspection on the part of the Commissmissioners in Lunacy, which, however, would necessarily require an augmented Board of Commissioners, the duties of the Board being already as much as they can well attend to. We have only to remark on this one, that we think the arguments adduced by the author are deserving, perhaps, of consideration by those who feel an interest—and they, no doubt, are not a few—on a point of detail which to discuss here would be out of place.

In the several numbers of the Journal of Psychological Medicine and Mental Pathology, edited by Dr. Forbes Winslow, which we have received since our last review on insanity, we have observed, as usual, a copious amount of information, at once interesting and valuable to the psychologist, whether practitioner or student. The number for April, 1852, contains a voluminous and *verbatim* report of the extraordinary lunacy case of Mrs. Catherine Cumming, tried before a special jury in the commencement of this year, and which created so great a sensation at the time. The trial occupies 178 closely-printed pages of the Journal, which will give some idea of the immense mass of evidence produced on the occasion,—evidence, too, of some of the mesmerico-medical witnesses of a most astounding and remarkable nature, and here given with the most scrupulous faithfulness. The opening article in the number for July, entitled "The Over-worked Mind," will amply repay an attentive perusal. Altogether the manner and spirit in which this valuable periodical continues to be conducted reflect the highest credit on Dr. Winslow, who is eminently deserving of the largest share of support, not alone on the part of the medical, but of the legal, profession for originating a Journal of such excellence in every respect.

Mr. Dickson, in his "Observations upon the Importance of establishing Public Hospitals for the Insane of the middle and higher Classes," treats on a subject of much interest, especially as regards the middle classes of society, for whose benefit the

establishing of suitable institutions is imperatively required, and which we have already referred to in our notice of Dr. Monro's pamphlet. But as respects the higher ranks, there would be much difficulty, it is to be apprehended, in the way of carrying out his proposition, which is that of dispensing entirely with all private and "licensed houses," in lieu of which he forcibly urges that Government should take the insane of all classes as immediately under its protection, as it has already done with regard to the insane of the pauper class.

"To do this," observes Mr. Dickson, "it would be necessary that Government should undertake, or cause to be undertaken, the institution of public hospitals, which might not only be self-sustaining, but also capable of liquidating the outlay of their foundation, providing a fund for emergencies, as well as a fund to be called the 'Benevolent Fund,' to be applied to the reduction of the charges of admission for those whose circumstances might seem to warrant such an application of the surplus."

Mr. Dickson then enters largely into detail on this subject, recommending that, as there are about 3000 persons now in private asylums, fifteen hospitals should be erected, capable of containing 200 each. He refers to an opinion expressed by the Earl of Shaftesbury, the Chairman of the Board of Commissioners on Lunacy, at a meeting held in 1851 in Staffordshire, when his Lordship is reported to have said: "That he hoped to live to see the day when every private asylum in England would be abolished;" and coming from such a source, great weight must, and will of course, be attached to it. The point, however, is, as we have observed, a difficult one in some of its phases; and here we must leave it, recommending Mr. Dickson's "Observations" to the attentive perusal of those who are interested in the question at issue, which, it must be admitted, is of great importance,—we mean as regards asylums under the immediate direction of Government for the upper ranks of society. With reference to the middle classes, we conceive their case is plainly most necessitous, being one of great hardship, and should at once be remedied by the establishing of suitable institutions for their due comfort and proper treatment when unhappily the subjects of mental disease; and on this head in particular both Mr. Dickson and Dr. Monro have done good service by calling attention to a subject at once distressing and urgent to a much larger extent than is generally supposed or known.

The number of the American Journal of Insanity for July, 1852, the only one which has reached us since our last Review,

contains, in addition to an extended "summary," the following articles of varied interest:—1. On Instantaneous Insanity, by Dr. Boileau de Castelnau; 2. The Lunatic Asylum at Havanna, by Dr. Pliny Earle; 3. Review of Reports of American Institutions for Idiots; 4. On the popular feeling towards Hospitals for the Insane, by Dr. Ray. This last paper is an exceedingly able and well-written one, as might be expected from the high character, professional and literary, of its writer, who for a lengthened period has filled the office of Physician-Superintendent of Butler Hospital for the Insane, Rhode Island. The scope of the paper is for the purpose of showing the prejudiced feeling generally, from without, which exists towards institutions set apart for the treatment of the insane, and the best means, peculiarly circumstanced as they necessarily are, of combating them,—feelings which, however ill founded, must more or less militate against their usefulness. Dr. Ray, with much truth, observes:—

"That the seclusion to which patients are subjected, by withdrawing them from constant observation, involves the institution in an air of mystery which stimulates the imagination, and excites the apprehensions of the ignorant and credulous. Any appearance of concealment very naturally gives rise to the suspicion of something wrong, and thus the very measures designed to promote the restoration of the patient are apt to be regarded as indications of a management that will not bear the light. Co-operating with this cause of ill-feeling is the natural disposition to attribute to others unworthy motives, and a readiness to abuse whatever power or confidence may be placed in them. The most prolific source of this distrust of hospitals for the insane is, undoubtedly, the communications of patients themselves, the more for falling, as they generally do, on willing ears. The friends of patients, too, are apt to be exacting and fault-finding, never satisfied that enough is done, though infinitely more, perhaps, than they ever did themselves, and restrained by no feeling of delicacy or gratitude from free and frequent expressions of their dissatisfaction."

In order to do away with the causes which keep up this state of things, the author, amongst other very sensible and just remarks, goes on to say:—

"The first step towards increasing the confidence of the public in our hospitals for the insane will be to deprive them, as far as possible, of their prison-like or peculiar features, and assimilate them to domestic dwellings. Narrow, dark halls, low ceilings, and bare walls, should give way to more spacious and cheerful apartments. The monotonous ranges of windows, row above row; the long, blank wall, extending its dreary monotony for many a rod: a style of

building, in short, which is no style at all, but that of providing the greatest number of rooms at the smallest expense, should be replaced by more pleasing forms of architecture, reminding us less of a jail or a factory, and more of a comfortable and graceful private residence. The house should be amply supplied with parlours well warmed, lighted, and furnished, in which patients might forget, for a moment, that they were not in a domestic dwelling, and lose some of their acerbity of feeling which is cherished, if not provoked, by the peculiar aspect of the rooms and galleries."

From the quotation which follows, it might be supposed that Dr. Ray had in vision our own Board of Commissioners of Public Works,—a Board which we have been more than once obliged to take to task for the manner in which it has in so many instances exercised the powers vested in it, as far as regards the erection and improvement of lunatic asylums in this country, and the mistakes which it has made, as might be expected, from ignorance as to the proper construction of such buildings, refusing to be directed or guided by those whose peculiar position enables them to afford advice and suggestions of the most valuable kind. Its model establishment, that at Dundrum, need only be visited by a practical man to see many deficiencies and defects therein,—the natural results of a wretched parsimony on the one hand, and want of correct knowledge on the other.

"The common practice of intrusting the erection of hospitals for the insane, whether with or without a plan, exclusively to a Board of Commissioners, having no practical acquaintance with the subject, cannot be too strongly condemned. To suppose that a person, because an eminent lawyer, or a successful merchant, or even a professed builder, is best fitted to superintend the building of an establishment so special as that of an hospital for the insane, is to ignore the universal experience of mankind."

We had marked several other extracts to quote from this excellent paper of Dr. Ray's, but which we regret we cannot insert, and must only refer our readers to the original as a very valuable monograph, well worthy of being carefully studied by those who are in immediate connexion with the management of public asylums, and in which they will find many suggestions deserving the best consideration.

We have before us the recently issued printed official paper containing the transactions of the Association of Medical Officers of Hospitals for the Insane, at their meeting held in London in 1851, the chief features of which, having been given by us in our last review on insanity, need not here be

repeated. The meeting for the present year of the Association was held in Oxford, by adjournment from London, in July last, synchronously with the annual meeting there of the Provincial Medical and Surgical Association of England, at which a large number of members was in attendance, and several matters of interest discussed in an excellent and friendly spirit. Amongst other resolutions adopted was one to the effect that a journal in immediate connexion with the objects of the Association should be undertaken, with the view principally of circulating amongst the members purely practical papers, and cases of interest in their department of the profession, the first issue of which it was arranged should take place this month. The next Stated Annual Meeting of the Association was fixed for Manchester, in July, 1853.

Before proceeding to notice separately the few Reports of our own Asylums which are contained in our present list, and come next in order, we desire to make a few observations of a general nature respecting the present condition and future prospects of the district asylums in Ireland. And, in the first place, we feel it our privilege, as well as our duty, to record here again that, notwithstanding what malcontents—parties who forget the axiom that "a straight line is the shortest in morals as well as in geometry"—may say to the contrary, our Irish district asylums may fairly be placed in juxtaposition with similar establishments in Great Britain or elsewhere, without any fear as to the result of the comparison, their system of management being in the highest degree satisfactory, and creditable to the authorities concerned in their superintendence. At all times they bore the test of the minutest examination, and never, in any one instance, was it discovered that an abuse of any magnitude in their conduct as public institutions had an existence, the treatment invariably pursued towards their inmates being proverbial for kindness and humanity. Indeed it might with every truth be stated that in our Irish asylums a system of treatment of the mildest and most unrestrained kind was originated and perfected; and hence it is that, during the thirty years nearly that have elapsed since the first was established, they have enjoyed the fullest confidence of the public at large, and have always been spoken of with honour and credit.

We are aware, however, that a system of internal management was approved of by the Executive of that period which now and for years past has been fully admitted to have been erroneous. We allude to the asylums being placed under the immediate charge of men who, however respectable in so-

cial position, and deserving of confidence as individuals, were not qualified for so responsible a charge, not being professionally educated. This, however, was simply the mistake of the times, which has been corrected by the recognition of a principle for some years back in operation, that medical men only should be placed over them. Nine years have now elapsed since that principle was first acted upon as vacancies occurred; and while we write, six out of the eleven asylums have resident physicians attached to them, viz., those of Belfast, Clonmel, Carlow, Limerick, Maryborough, and Cork.

And here it should be observed, that as no retiring pensions or superannuations are allowed to the officers of our Irish lunatic asylums, no matter how long or faithful their services may have been, or whether sickness, age, or any other impediment, should incapacitate them from a due fulfilment of their arduous duties,—an injustice the continuation of which is anything but creditable to the Government of the country, but which we hope soon to see remedied,—it would, of course, have been unreasonable and unjust to displace the existing non-professional superintendents, however desirable for the institutions themselves to have resident physicians; yet this, it would appear, is what some most unreasonable and impracticable parties would require, finding fault with the authorities because it is not attended to, and doing all they can by misstating the case, and by other means, to have the inference drawn, that the asylums generally are carelessly looked after, and their best interests neglected by the "powers that be:" but it is only those at a distance who could be led astray by this disingenuous line of proceeding[a]. And in further proof of the *bonâ fide* intentions of the Government, it should be stated that, in the new district asylums which are about being immediately opened, medical men of high professional and moral character have been appointed as superintendent physicians; the new Asylums at Killarney, Kilkenny, Mullingar, Sligo, and Omagh, have been thus officered; and too much praise cannot be bestowed upon Drs. White and Nugent, the Government Commissioners of Hospitals and Houses for the Insane in Ireland, for the indefatigable manner in which they have laboured to have the asylums in Ireland not only superintended immediately by medical men, but also for the strenuous and successful effects they have made and are making to obtain for them suitable salaries, and also superannuation allowances. A worse economy there could not be than that of cutting down salaries to the lowest figure, for in order to procure the services

[a] See Medical Times and Gazette for September 3, 1852.

of the best men to fill such responsible and confidential situations as those of intern physicians to an hospital for the insane, a liberal remuneration must be afforded; besides which, the chief resident officer of each public asylum should, we think, be an *ex officio* member of his Board of Governors, in order to afford him the opportunity of speaking his mind freely on all matters connected with the welfare of the institution for which he is responsible. Here, however, his power should cease, as we are of opinion that the right of voting should not be allowed to him. The resident physician of the Glasgow Royal Asylum for Lunatics takes his place at the Board as a matter of course. The more unshackled the head of an asylum is placed the better it will be for the whole institution; for from him, as the mainspring of the house, will the house take its tone and its character. The government of an asylum, we take it, must be an autocracy in degree, otherwise its important duties will never be efficiently performed. *All* the intern officers and domestics should be under the control of the superintendent, and appointed or discharged by him: this is only reasonable, inasmuch as he is responsible for the performance of the duties of the whole establishment, which it is preposterous to make him unless he be vested with plenary powers in the appointment and dismissal of his assistants. One more observation and we close these general remarks. It is this, that from long consideration of the subject we have come to the conclusion that the inspectors of asylums should be chosen from amongst the physician-superintendents. A small matter of reward this for them to look forward to, but in all common justice this promotion should, as a paramount right, go in the corps. It would act as a wholesome stimulus, and indirectly elevate their status, and for the performance of duties so confidential and peculiar in themselves, is it not plain that they, and they alone, are the fittest persons to be appointed to such an office? The late Lord Cottenham, when Lord Chancellor, admitted the principle. He appointed the medical superintendent of a county asylum to be one of the paid Commissioners of Lunacy in England, and this despite of being pressed by the second highest personage in the realm to bestow the office on another, an eminent physician, but who was not "duly qualified and experienced" in the treatment of the insane.

The Nineteenth Annual Report of the Carlow District Hospital for the Insane Poor, by Dr. M. E. White, the resident physician, brings the affairs of that institution to the 31st of March, 1852, at which date the number of patients in the

house amounted to 199 (103 of whom were males, and 96 females). The cases admitted during the year amounted to 66 (33 males, and 33 females). The number discharged recovered during the year was 32 (18 males, and 14 females); ditto, relieved, &c., 16 (9 males, and 7 females): the deaths were 16 (10 males, and 6 females), the causes of which were, cerebral congestion, 1; scrofulous disease of the pancreas, 1; scrofulous tubercles in mesentery, 1; dropsy, 1; dysentery, 2; hemorrhoids, 1; "paralysie des aliénés," 2; pneumonia, 1; phthisis pulmonalis, 1; maniacal exhaustion, 2; old age and natural decay, 1. The greatest mortality was in the months of April, 1851, when 4 died, and February, 1852, when 3 deaths occurred. The supposed curable cases were but 47, and incurable, 152. The total year's expenditure was £3084 16*s.* 1*d.*, making the average annual cost of each inmate £15 14*s.* 11¾*d.* The tobacco and snuff during the year amounted to £22 5*s.* 7*d.*, an outlay which we regret still to see in this and other asylums, and which we would strongly recommend each superintendent gradually to curtail, until ultimately the use of "a weed" so vile and hurtful to the body as well as the mind, be banished for ever from our hospitals for the insane. The Report states, that during the past year the general dietary had been altered, and considerably improved, which induced us to examine it all the more carefully as given among the other tables, but to our surprise and disappointment we found the *cuisine* department of the institution was meagre enough after all,—the poor recipients of its "considerably improved" liberality not enjoying a single ounce even of solid meat during the whole week! to say nothing of the nice *fractional* apportionment of the bread which we referred to last year being still continued. We trust that Dr. M. E. White, whose regard for his patients, we are satisfied from the whole scope of his excellent Report, and the high character he bears as an active and intelligent official, will look to this, and endeavour to have the "general dietary" still further improved by a reasonable allowance of solid cooked meat being afforded to his charge two or three days in the week at all events. Dr. White recommends that some additional ground should be purchased for the Asylum, observing, very truly, "that nothing conduces more to the cure of insanity than moderate and well-regulated employment," in which all who have experience in asylums will most fully concur, there being nothing more beneficial than out-of-door occupations for the insane, be they poor or rich. The Report expresses much indebtedness to Drs. White and Nugent, the Inspectors, for their unceasing attention to the interests of all under their charge; and acknowledg-

ments are made also to Dr. O'Meara, the visiting physician, for the courteous manner in which his duties were discharged.

The Report of the Maryborough District Asylum, to 31st March, 1852, is still printed, we perceive, on an unpretending folio sheet, which already we suggested should give place to somewhat more of a professional and an official form. In thanking the Governors for attending to his suggestions, and otherwise co-operating with him, Dr. Burton, the writer of the Report, goes on to say, this proves "how easy it is for subordinate officers to fulfil their duties, when their superiors understand and countenance them in that discharge." We cannot avoid remarking, that we think Dr. Burton, in paying homage to the Governors as his "superiors," in "countenancing" him as a "subordinate," has rather forgotten his own proper place and position. A whole page of this folio Report is taken up with individual accounts, which should have been quite sufficient to have been seen by the governors, relating, as they do entirely, to the uninteresting petty details of "charge and discharge" during the year. More valuable matter might easily have been at command, in lieu merely of fiscal items and explanations about "painting" and soforth, which we conceive are out of place altogether in documents coming from the hands of professional men, who should content themselves with a short abstract of expenditure. The Reports which emanate from hospitals for the insane having resident physicians are naturally and reasonably expected to contain data very different from what in former days would have passed muster. The district asylums are now in a rapidly transition state, and should not, as formerly, be considered as mere places of detention and security, but as curative establishments for the subjects of mental disease, and schools for instructing advanced students in medicine in the general treatment of insanity, which we hope soon to see them; and, in the mean time, their Reports should savour more of a really professional, than a merely financial character. Having made these observations, which we trust will be taken as they are given, in a kindly spirit, we may proceed to state, that the whole expenditure incurred during the year in this very creditably conducted asylum amounted to £3086 12*s.* 9*d.*, making the average expense of each inmate £16 1*s.* 6*d.* The cost per head for food (patients and servants) was £5 3*s.* 7*d.*; the clothing for each patient was £1 8*s.*; and the cost in salaries and wages was £4 2*s.* 5*d.* As regards the dietary of this Asylum, we find that no solid meat is allowed to its patients, their dinner consisting for three

days in the week of a quart of soup and twelve ounces of bread (ten ounces for females), and for the other four of bread and buttermilk, or skim-milk, which we must look upon as a most insufficient bill of fare for that principal meal; and further, seeing that Dr. Burton refers to "some severely protracted and intractable cases of dysentery," as having prevailed during the year, it strikes us that the general dietary being of the liquid character, it may have tended much to this undesirable state of things, nothing being more certain or settled now than that a nourishing system of feeding, with a fair proportion of animal food, is absolutely requisite for the insane, who, as a class, are most prone to diarrhœa and dysentery at all times. We are glad, however, to perceive it stated by Dr. Burton that the inspectors-general had suggested a change in the dietary, and that both Dr. Jacob and himself intended to submit this important matter in the domestic economy of the institution to the Governors at an early period. The number of patients under treatment during the year was 230; of whom were discharged, cured or relieved, 27; and of whom died, 23; leaving on the books, on the 31st March, 1852, 188 (96 males and 92 females).

The number of patients in the Belfast Asylum, on the 1st April, 1851, as shown by Dr. Stewart's twenty-second annual report of that institution, was 269 (150 males and 119 females); since which the admissions to 31st March, 1852, amounted to 124 (54 males and 70 females); the total under treatment during the year being 393 (204 males and 189 females). The discharged recovered were 62 (30 males, 32 females); ditto, relieved, 24 (9 males, 15 females); and died, 27 (11 males, 16 females); leaving under treatment on the 31st March, 1852, 280 (152 males, 128 females); 186 of whom (106 males, 80 females) were considered chronic or incurable cases; and but 94 (46 males, 48 females) probably curable. The forms of disease of the 280 were as follow:—Congenital idiocy, 4 (males); dementia, 32 (12 males, 20 females); mania, 190 (113 males, 77 females); epileptics, 13 (7 males, 6 females); monomania, 41 (16 males, 25 females). The year's expenditure amounted to £3459 4*s.* 2*d.*; the average cost of each patient being £12 10*s.* 8$\frac{1}{2}$*d.* A considerable extension of the establishment for the accommodation of additional patients, &c., the Report states, was about being immediately carried into effect.

The final Report of the Committee appointed to provide an additional Asylum for the Pauper Lunatics of the Co. Mid-

dlesex, presented at the January General Quarter Sessions, 1852, is a voluminous document, containing a full report of the proceedings of the Committee intrusted with so important a charge as the above, embodied in which are the first Medical Reports of the physicians-superintendent, then Drs. Hood and Davey, the former having the charge of the male, and the latter, the female departments respectively. From the Committee's Report we find that, after much consideration, they selected Colney Hatch, at the eastern side of Middlesex, as the most eligible site for the second asylum requisite for the county, making a purchase of 119 acres, at £150 per acre. The foundation-stone was laid by Prince Albert, on the 8th May, 1849, and on the 31st October, 1850, less than 18 months afterwards, the building was placed in the hands of the Committee, complete as contracted for. On the 17th July, 1851, patients were first received; the total numbers admitted up to the date of the Report, viz. 31st December, 1851, amounting to 1080 (411 males, 669 females). The cost of this immense establishment has been £289,356 5*s.* 6*d.* The following are some of the items of an expenditure of such magnitude:—Land, £19,786 4*s.* 8*d.*; contract for building, £138,000; warming and ventilating, £11,583 11*s.* 3*d.*; hot and cold water-works, £10,271 16*s.*; drains, £4034 13*s.* 9*d.*; earthwork, laying out grounds, shrubs, &c., £12,281 3*s.* 6*d.*; formation of roads, airing-courts, ballast, gravelling, and draining same, £16,430 17*s.* 3*d.*; furniture, £10,084 10*s.* 2*d.*; architect's commission, &c., £3448 3*s.* 8*d.* It was originally contemplated that the building should contain 1000 patients as the maximum, but it is capable of eventually accommodating from 1300 to 1500,—an accumulation of patients under one roof and within the same precincts, which we must again refer to here, as we have done on a former occasion in noticing one of the manias of the present day in erecting "leviathan asylums," is much to be deprecated, being entirely and altogether opposed to the opinion of experienced professional men who are alone competent to form one on a subject of such paramount importance. But the economizing spirit of the day has been the source of these proceedings, and badly does it speak for the humanity of the greatest nation of the world, that the interests of those of its people who are stricken down by so dreadful a dispensation as that of insanity should in anywise be tampered with at the shrine of a most mistaken economy. The miserable and paltry salaries, too, which are paid to the two physicians of this *colony* of insanity at Colney Hatch are indications too palpable of this system of grinding down to the lowest far-

thing. Imagine a salary of but £300 a year each to two gentlemen, highly educated, acting as physicians of mind and body to more than 1000 patients between them! It is disgraceful in the extreme, and is already calling forth just and well-merited censure from the entire professional press of the country. And what is the consequence of this paltry remuneration?—before one year even had elapsed after this asylum is in operation, both physicians resigned their appointments, only holding them, as might have been expected, until something better came in their path; and so it may be concluded that change after change will thus be occurring so long as such dishonest payment of services continues to be made. Instead of only two physicians being employed for such a vast amount of labour, both mental and physical, six, at the very least, would be required, in order that the duties of an institution, so wholesale in its operations, should be at all efficiently performed. No man, we emphatically declare, could by any possibility do justice to himself or his patients by taking the entire medical, moral, and mental charge of 500 insane persons,—the thing is physically impossible.

Dr. Kirkman's Fourteenth Annual Report, for 1851, of the Suffolk County Asylum is drawn up, as usual, in a very succinct and satisfactory manner; the statements given affording every evidence of that institution being conducted with continued zeal and ability on the part of its immediate authorities, headed by its excellent and long-tried physician-superintendent. The total number of patients treated during the year (the new admissions being 91,—36 males and 55 females), was 341, 149 of whom were males, and 192 females. Of these there were discharged cured, 51 (25 males and 26 females); ditto, relieved, &c., 11 (3 males and 8 females); and died, 35 (20 males and 15 females); leaving in the Asylum, on the 31st December, 1851, the number of 244 (101 males and 143 females). Referring to patients being sent in either in an exhausted state, or in very old age, Dr. Kirkman states that six had been so admitted during the year, three of whom were in *articulo mortis*. On this point he very properly observes:—

"It is a great question whether patients, beyond the age of seventy, should be removed from their homes to asylums at all; and when the evident phase of disease is merely senile imbecility, and that of the most harmless character, only requiring the care of an attentive nurse, it is unjust to the institution, by increasing its mortality, to send them; and the removal, often from a considerable distance, injurious to the patient. An old man was admitted, on

November 28, aged 82, who could only be supported, or indeed kept alive, by beef-tea and wine; he died in a fortnight. We had another of 72, another of 70, requiring just the same treatment, but ending in the same result."

On the subject of employment the following remarks are very just:—

"The mind, like the body, spontaneously impelled to exertion, by the example of all around it, not only forgets its pain or its sorrow, but ceases to be what it was before, a power degraded to habitual inertia for want of external excitement. Thus, by pleasureable, and therefore profitable, engagement, ordinary cases rapidly advance to their cure; deliverance is constantly obtained from the otherwise uncontrollable paroxysms of variable mania, and relief diminishes that weight of darkness which is the characteristic of a gloomy melancholy. . . . . It is indisputable that proper employment must always form a prominent part in the salutary treatment of the insane; it is the curative process in *many*, consolatory process in *most*, and an advantageous process in *all*. The employed are amongst the well-disposed and quiet, the unemployed amongst the disturbing and disturbed. It has, indeed, been alleged by some who idolize optimism, rather than study practicability, that there should be *no* patients unemployed. This is undeniably the only limit to which our exertions tend; but still it must *necessarily* be a valuable desideratum, rather than a feasible result, with an account of cases which *cannot* be employed as some *idiots*, and of others which *will* not, as those whose more evident manifestations chiefly consist in obstinacy and idleness."

We perceive, by Dr. Kirkman's Report, that the question is still being agitated in England about placing patients, not strictly paupers, in county asylums, by the patients' relatives, and the parish paying each a portion according to the ascertained capabilities of the former. The same subject has been often under discussion in Ireland, and the proposition made of placing such patients in the district asylums, by their friends paying the average annual cost of the ordinary inmates. We unhesitatingly denounced this proposition as one that would never afford satisfaction to any party, and if carried into effect, that it would most seriously militate against the comfort and good working of the district asylums. We are still of the same opinion, and trust that the matter, so far as Ireland is concerned, has been set at rest; but should it again be stirred, we hope it will not fail receiving the most decided opposition. Dr. Kirkman's views and our own are completely in unison as regards this matter. He says—

"A pauper asylum should be what it professes to be, an hospital for the insane poor; and if other classes are made legally *admis-*

sible, there will be continued proofs of that restlessness which all incongruous mixtures produce. Nothing but a separate institution for each class will succeed. If the advantages of a county asylum are important to obtain, perhaps a separate building in connexion with it might answer; but to place both under the same roof, and thus necessarily to subject them to the same discipline, will be satisfactory neither to the one nor the other. If *patients* whose own friends pay, be the payment ever so small, have the same diet, and the same treatment generally as the paupers, *they* will be dissatisfied, and if any difference is made for such, the general body will be discontented."

Professional religious instruction, in a lunatic asylum, is a *quæstio vexata*, not confined to Ireland alone, where there are so many angry elements, owing to difference of creed, to cause strife and contention by the multiplication of chaplains, but in England also, with but one form of religious faith, the propriety of chaplainizing her hospitals for the insane is more than doubted. The following is what so good an authority on this point says:—

"The subject of religious instruction is too delicate to be discussed in an ordinary Report. It will be enough to convey the repeated conviction, that to be really effective, *professional* can never supersede *domestic* instruction; the administration should be in that guarded manner which is only learned by the knowledge of the existing peculiarities of the parties addressed. Moral delinquencies may arise from mental idiosyncracies which need great forbearance, and a peculiarly delicate mode of conveying instruction in righteousness. A patient went home well, whose relapse, after a former discharge, came on, as he expressed it, 'after hearing an alarming sermon;' his morbid conscientiousness was morbidly acted on, and he left the church to cut his throat. He is now well again."

We have ourselves only further to remark on the foregoing, that we feel firmly impressed no such office as that of chaplain should be attached to any lunatic asylum whatever, much less to those of them containing members of the different sections into which Christianity is split in this country. We would not debar patients from being visited by their respective ministers of religion as frequently as might be deemed prudent, or in accordance with the desire of individual patients,—quite the contrary: but to have religious offices for the patients *en masse* in a lunatic asylum, as a regular routine business, performed by a chaplain or chaplains, we hold to be entirely and altogether unsuited for those who are considered fit inmates for such establishments. Religious instruction, we consider, is as much part and parcel of the medico-moral treatment of the patients as their diet, exercise, employment, medication, &c., which are

placed in the hands of the medical officer charged with the conduct of the whole institution, and who should no more be interfered with in this particular of management than in any other, for the performance of which he alone, and properly so, is the responsible party.

The Manchester Royal Lunatic Hospital, under the medical superintendence of Mr. Dickson, is an institution which has been in operation since June, 1850, being then established, its first Report states, for the "reception of patients from various classes of society, commencing from the highest class, at weekly rates of payment of £4 4*s.* and £5 5*s.*, and having graduated scales of charges down to 15*s.* weekly, in proportion to the nature of the accommodation. One of its main objects, however, is to alleviate the sufferings of the middle and lower classes,—of those who cannot afford the rates of payment required by the better class of private establishments, but whose circumstances are such as to render it undesirable to drive them to the disagreeable necessity of becoming inmates of the County Lunatic Hospitals." The institution is situated at Cheadle, a rural district in Cheshire (eight miles from Manchester), with extensive and well laid out grounds, thus affording every facility for out-door exercise, which is so absolutely requisite in all such institutions, and in which, if limited, their usefulness must be in a great degree rendered nugatory. Since the opening of this hospital 65 patients have been admitted (39 males and 26 females), of whom 17 have been discharged cured, 9 removed by desire of friends, 6 have died, and 33 remained under treatment. Contained in the Report is an account of the official visits, on two several occasions, of the Commissioners in Lunacy, who each time have reported favourably upon the general management of the institution.

The Fourth Annual Report for 1851, of the Somerset County Asylum for Insane Paupers, contains a large amount of interesting information, afforded by Dr. Boyd, its intelligent Superintendent-physician, from which we regret much our limited space prevents us giving any extracts. The patients under treatment for the year amounted to 441,—122 of whom (64 males and 58 females) were new cases. The discharges in recoveries, &c., were 61, and the deaths 40 (23 males, 17 females), leaving in the Asylum at the end of the year 340. The statistical tables are very numerous and satisfactory, giving in this form the fullest particulars, under their respective heads, of all matters connected with the treatment, &c., of the inmates.

The obituary table, especially, contains a large amount of information, in a condensed form, as to post-mortem appearances, &c. well worthy of attention. Dr. Boyd mentions, as a remarkable circumstance connected with the year's admissions, the number of suicidal cases, which was so large as 36, 12 males and 24 females. The expenditure of the year in support of the Asylum amounted to £7039 8*s.* 10*d.*, included in which, we regret to state, is a sum of £71 1*s.* for tobacco and snuff.

The Aberdeen Lunatic Asylum is under the resident medical charge of Dr. Campbell, the Report of which, for the year ending 30th April, 1852, is an exceedingly well-compiled document, and from which we learn that the patients treated during the year were 312 (148 males, 164 females), 84 of whom were new admissions (36 males, 48 females). The discharges in recovered, improved, and unimproved, were 42 (14 males, 28 females); the deaths amounted to 20 (11 males, 9 females). The expenditure of the year was £4016 18*s.* 3*d.*

The Annual Reports which come from the pen of Dr. Browne, the able physician in immediate charge of the Crichton Royal Institution for Lunatics at Dumfries, are always very elaborate and original productions. That for the year 1851 is replete with disquisitions on features all of more or less importance in the treatment of his patients, and the general conduct of his hospital for their care and comfort. In referring to the anxious and never-ceasing duties and responsibilities inseparably attached to the management of an asylum, Dr. Browne expresses himself as follows, and in terms not less true than forcible:—

"If it be recollected that there is no holiday from the vagaries and caprices and sufferings of the insane, nor from the supervision and anxiety which these exact; that every new case creates new cares; that to provide amusements and relaxation, the toil of all around is multiplied; that the seclusion of the guardians is nearly as complete as that of their charges:—it must be matter of satisfaction that individuals have been found capable of such self-denial, and of discharging such complicated and arduous duties, who interpret aright the godlike act of offering a hand to the lunatic, and raising him up, and whose chief reward consists in seeing him seated clothed and in his right mind."

That the inmates of the Crichton Asylum are not ascetics, but wide awake to the exciting amusements and pleasures of ordinary life, the following extract from Dr. Browne's Report will fully attest:—

"Dances on the green have alternated with drawing-room reunions; bowls have succeeded billiards; excursions have given place to dramatic representations; and the theatre is appropriated as a lecture-room whenever expositors can be obtained, or there occur opportunities for the exhibition of natural phenomena, or the wonders which the human hand or voice can perform."

Truly, this is a unique state of things within the walls of an asylum, and fortunate must its inmates be who have so unceasing a caterer as Dr. Browne to provide for them such agreeable antidotes to dissipate all their sorrows and cares, whether real or ideal. Under the respective heads of "Idiots, Imbeciles, Maniacs, Monomaniacs, Melancholics, Suicides, Homicides, Panic-struck, Night-watchers, Hypochondriacs, Fasters, and Optimists," Dr. Browne gives cases of patients of each denomination admitted during the year,—all admirably well delineated, and very suggestive in various ways to the psychologist. We wish we could find room to give further extracts from this interesting Report of Dr. Browne on the Crichton Institution (which, we should observe, partakes of the character both of a private and public asylum); but we are unable now to do more than merely to state that the patients who were treated during the year amounted to 257, the new admissions being 69; recovered and discharged during the year, 31; discharged improved or during treatment, 7; died, 13. Amongst the admissions were, 1 clergyman, 2 physicians, 1 surgeon, 1 lawyer, 2 officers in the army, and 1 in the navy.

The new County Asylum for Wiltshire, situated near Devizes, was opened, we find by its first Report, now before us, in the autumn of 1851, under the superintendence of Dr. Thurnam, a gentleman of high character in his profession, and distinguished as the writer of a work of much worth, entitled "The Statistics of Insanity," of which, at the time of its publication, we were enabled to speak in the strongest terms of praise[a]. The institution was erected to accommodate from 280 to 300 patients, and, at the date of this Report, December 31, 1851, there had been admitted a total of 167 (73 males and 94 females), of whom 2 only had died, both being males. The Report contains a full and interesting description of the building, as such, accompanied by a ground plan, an addition which we would strongly recommend the officers of all new asylums to supply in their Reports, the expense of which would be inconsiderable, and the advantages, for various rea-

[a] Vol. x. No. 20, N. S. p. 417.

sons, very great. The Italian style of architecture is that which has been adopted, as the most simple, light, and cheerful, and giving the greatest effect at the least cost. We are glad to find that the Asylum is built, as all should, on the system of fire-proof construction, known as Fox and Barrett's patent, consisting of iron joists and concrete; and as another precaution against the dire casualty of fire, the floors of all the corridors, day-rooms, dormitories, and single sleeping-rooms, are formed of one and a fourth inch yellow deal battens, slate sills being introduced in the doorways, so as to cut off all communication in case of the floor of any one room taking fire. The corridors, it is stated, are eleven feet high and twelve feet wide, which is a vast improvement on our new Irish asylums in this latter respect, and which, in a former review[a], we suggested was the width that should be adopted in them, and, at the same time, had occasion to animadvert upon the Board of Public Works for opposing the recommendation of the Inspectors of Asylums in this point of detail. As regards the arrangement of the wards in this new hospital for the insane, we find that the day-rooms are twenty-two feet long and seventeen wide (the height of all rooms, corridors, &c., being eleven feet); the single sleeping-rooms are nine feet long and six and a half wide, a few with fire-places being a foot wider; the cubic capacity of the former being about 683, and the latter 782, feet. There is a large proportion of associated dormitories, for of the 286 beds for patients contained in the hospital, 178, or 62 per cent., are arranged in this manner, the remainder being in single-bedded rooms. This is a per-centage which strikes us as being entirely too large, for we must confess that we by no means approve of the system which is being adopted of late, of having so small a number of single rooms in our public asylums: the patients themselves feel it a sore evil, if not degradation, being thus herded together, a single room being much desired by the greater number of them, and with which we have no hesitation in saying they should have the means of being provided. Dormitories, we admit, have their advantages, and no asylum should be without a few, but they should be the exception to the rule, and should never contain more than five or six beds; but each in this institution contains from eight to eleven. The warming and ventilation of hospitals for the insane being of primary importance, we are glad to notice that, in these respects, the Wilts Asylum is not deficient, similar apparatus for the warming and ventilating of the

[a] Vol. x. No. 20, N. S. p. 423.

building being employed as erected in the Oxford, Colney Hatch, and other new Asylums, by means of which an average temperature of at least fifty-five degrees can be preserved through the severest weather, and by which the external air, admitted in large quantities, passes over a series of plates and pipes filled with boiling water, and from the hot air chamber passes into large flues running the whole length of the corridors. And, what is a matter of great moment, the separate sleeping-rooms, dormitories, and bath-rooms, are warmed by distinct flues branching from the larger mains. But though this artificial warmth is so fully provided for, as it should be, open fire-places also are called into requisition in all the day-rooms, attendants' rooms, &c., which it is desirable should be the case; the cheerful and bright blazing fire in winter being, in our experience, indispensable, and promotive, to a large extent, in soothing and exhilarating the patients: indeed, we do not know a happier sight than to see a number of them sitting around the hearth of a winter's evening, thus enjoying themselves. We say emphatically, then, that by all means the good old custom of open fire-places should be kept up in our asylums, as well as in our ordinary homes, be the warmth otherwise of our apartments complete and sufficient as it may. A cemetery is attached to this Asylum, in common, as is the case with several others in England, a practice, however, which we consider most objectionable, and calculated to act very unfavourably on the minds of a large number of the inmates. "Bury my dead out of my sight," should be as religiously carried into effect in an hospital for the insane as in the private relations of ordinary life; and who is there, even amongst the sane living, that would not feel depressed at being in constant immediate propinquity with a place set apart for the dead? We should not omit to mention, that the quantity of land belonging to the asylum is sixty-five acres, which, with all its other arrangements, is on a fittingly liberal scale, a large space of ground being, we would say, the life's blood and spring of such institutions. On the whole, we deem it that we have full grounds for saying, that the Wilts Asylum has been established in a manner which reflects much credit on its Committee of Visitors and all other parties concerned in its management.

Dr. Henry Monro's work, entitled, "Articles on Reform in Private Asylums," is a republication of what has already appeared in a separate form in the Psychological Journal, Medical Gazette, and Lancet. The articles are five in all, and the principal questions discussed in them are,—the removal of the

civil responsibility (incurred by detaining a patient in a private asylum) from the proprietor to the Commissioners in Lunacy, the attainment of which object is shown to be in no way opposed to the continued existence of private asylums; the peculiar advantages of private asylums; the necessity for their being more frequently inspected than four times a year; an enlarged Board of Commissioners in Lunacy; the advantages of increased Reports on private asylums; augmenting the means of information as to the condition of private asylums; the ordinary faults of attendants, &c. The above subjects are each and all very minutely entered into, and treated with much earnestness by the writer, who also, in a distinct article following those now referred to, calls attention to the necessity of public asylums for the middle classes,—a point which, having already been referred to in the course of this Review, need not now be further considered.

The Eighth Annual Report of Dr. Benedict, the medical superintendent of the New York State Lunatic Asylum, for the year ending 30th November, 1850, shows that the state of the Asylum at that period was as follows:—Patients in the house at the commencement of the year, 449 (males, 226, females, 223); admitted during the year, 367 (males, 185, females, 182); total number treated during the year, 816 (males, 411, females, 405); discharged recovered, 171 (males, 94, females, 77); much improved, 8 (males, 4, females, 4); improved, 49 (males, 26, females, 23); unimproved, 108 (males, 51, females, 57); died, 51 (males, 34, females, 17); total discharged and died, 387 (males, 209, females, 178); remaining 30th November, 1850, 429 (males, 202, females, 227).

The causes of death were as follow:—Chronic mania, 12; acute mania, 3; dysentery, 13; general paralysis, 3; operation for strangulated hernia, 1; pleuritis, 2; acute gastritis, 1; typhus fever, 1; acute dementia, 1; erysipelas, 4; phthisis pulmonalis, 2; diarrhœa, 2; aneurism of aorta, 1; phagedæna, 1; ascites, 1; metro-peritonitis, 1; strangulation, 1; suicide, 1: total, 51. Dr. Benedict remarks, with reference to the deaths from dysentery, that under it he had included a form of disease very unlike that of private practice and of hospitals in ordinary, but which he believed was common in asylums, and which he did not recollect to have seen called by any other name. He adds:—

"It occurs in chronic cases, whose powers of life have been long gradually sinking, and in recent cases, who have become much exhausted by protracted excitement. Without premonitory symp-

toms, or exposure to known exciting causes, the patient is suddenly seized, and generally in the night, with bloody discharges, scanty and gelatinous, or more frequently copious and serous, with no heat of skin or abdomen, nor pain, nor thirst, nor loss of appetite or strength. Death supervenes a few days after the attack. We have witnessed but little benefit from remedies in this form of disease, the treatment for ordinary dysentery proving entirely nugatory."

The cases of acute mania admitted during the year were 38; and amongst other means used in its treatment was the free and continued administration of brandy, from eight to twelve ounces being given daily, and that, too, for weeks, as was the practice, Dr. Benedict states, "in mania a potu, the two diseases resembling each other in many of their symptoms and post-mortem appearances, and admitting of, if not demanding, similar treatment." In cases of paroxysmal mania in particular, the free use of tincture of opium was had recourse to in the New York Asylum, "in doses from half-a-drachm to four drachms, frequently repeated," a dose which appears to us rather "heroic." On the subject of restraint Dr. Benedict expresses himself openly and honestly, as follows:—

"We occasionally confine a patient to his room for half-a-day, a day, or two days, but rarely for three days. Paroxysmal cases, and some of uncontrollable temper, are occasionally thus confined. We believe the average seclusion for the year has not exceeded 1 per cent. In about the same ratio mechanical restraint is worn by the violent and dangerous. We frequently pass weeks without any man wearing restraint; but we have to resort to those means more frequently among females, owing to the greater difficulty with which they are prevented from destroying their clothing."

Dr. Benedict states, that some attempts had been tried to make schools useful, but without any satisfactory result, though having persons exclusively engaged in this duty for either sex, besides having several patients well qualified to teach. In addition to Dr. Benedict, as the chief superintendent physician of the New York Asylum, there are three assistant physicians to aid him in the performance of his onerous duties. Here, then, is an example for Hanwell, Colney Hatch, and other large Asylums, with their thousand patients and upwards; and where two medical men in each have work put on them for which half-a-dozen would be required, to do anything like justice either to superintendent or patients. In fact, no asylum, no matter how limited its inmates, much less the above mammoth institutions, should be without its junior medical staff, or *internes*, as is the case in the French asylums generally,

to assist the chief medical officer, and to see that his instructions are fully carried out. This is a desideratum which we hope ultimately to see accomplished in all our public hospitals for the insane, than which nothing is more needed, and which in various ways would tend to the best results.

The work of M. Morel, the last on our list, furnishes a good example of what might be advantageously done by the physicians of our asylums at home, were the opportunity afforded them. Many years since, in France, Pinel and Esquirol opened the vast stores of information at their disposal, in the hospitals for the insane to which they were attached, to a few select pupils, and after them M. Ferrus freely permitted the access of students to the Bicêtre, and delivered clinical lectures there from 1832 to 1839. Dr. Archambault, the immediate predecessor of our author, as physician to the Maréville Asylum at Nancy, having obtained the permission of the Government to admit pupils to receive clinical instruction there, found that it in no way interfered with the recovery of the patients; and M. Morel, therefore, on his appointment had no hesitation in following the example thus set him, and he commenced his first course of clinical lectures on insanity in May, 1851. These lectures are now in course of publication; and, with the view of rendering them as good substitutes as possible for the original instruction, portraits are given of those patients in the asylum who were selected as representatives of the several phases of insanity described. Did even our space permit, we would be unwilling to attempt any analysis of this work until its completion, when we purpose to bring under the notice of our readers some of the highly valuable matter contained in it. At present we shall content ourselves with a strong recommendation of the volume to all engaged in the study or treatment of insanity. The lithographic illustrations are truly beautiful portraits, whether regarded as works of art, or as faithful representations of the characteristic expression peculiar to those afflicted with the different varieties of mental disease.

On the Anatomy and Physiology of the Male Urethra, and on the Pathology of Strictures of that Canal. By Henry Hancock, F.R.C.S.&c. London: Highley and Son. 1852. 8vo, pp. 86.

It must be expected that, amid the mass of writings upon the subject of urinary diseases, much that is useful and much

that is worthless are to be found. The works of Home, Brodie, and Guthrie, while they have immortalized their authors, have afforded invaluable information to the profession, and have, in fact, formed the foundation upon which many others have constructed works of no inconsiderable value; but, on the other hand, if we give one-half of the publications upon this subject which almost daily emanate from the press an unprejudiced perusal, we must admit that they are, to say the least, utterly worthless, and calculated to lower the standard of instruction in so important a department of surgery. Were we to measure the importance of the subject of stricture of the urethra solely by the amount that has been written thereon, we should assuredly concede to it the first place in the long category of the diseases of man; but if the value of the majority of these writings is to be the test of its importance, it must certainly be placed much lower.

The small volume, the subject of the present review, composed though it be of but three lectures, which were delivered before the Medical Society of London, contains, we are happy to perceive, valuable pathological and physiological instruction, exhibiting within a narrow compass no little originality upon the part of the author, and adding to those laurels which he has already won in his professional career. The subjects treated of are:—The muscularity of the urethra, normal micturition, and stricture of the urethra; and though we may not concur in some of Mr. Hancock's observations, we cannot but be struck with the diligence and energy of his research in these interesting departments of physiology and pathology.

The idea of the urethra being muscular was entertained years ago by Hunter, whose sagacious mind led him to perceive how readily upon such supposition many of the difficulties connected with the normal action of the urethra and of the phenomena of stricture, could be explained. Sir E. Home, assisted by that able microscopical investigator, Bauer, carried out the same view, and since his time numbers of highly distinguished anatomists and physiologists have investigated the subject; but none appear to have accurately pointed out the arrangement and the situation of the muscular fibres which are said to surround the urethra except Mr. Hancock. Allowing that the priority of noticing the existence of muscular fibres around the urethra is due to Kölliker, and even supposing that our author is altogether in error regarding these fibres, he deserves, without doubt, the highest credit for the ability with which he has prosecuted the inquiry, and has brought analogical reasoning to bear in support of the results of microscopical examination. The author complains that, even in the present day, notwith-

standing all that has been done to prove the muscularity of the urethra, many are found who deny its existence. This, however, is not to be so much wondered at. The muscular fibres described are invisible to the naked eye, the proof therefore of their presence depends entirely upon microscopic examination, and unless we are satisfied with the accuracy of it, we cannot be supposed to receive as demonstrated facts any of its revelations, and we know how frequently microscopists have been deceived and mistaken. Again, almost all the phenomena of stricture can be explained upon the supposition that the urethra is not muscular. In speaking of the suddenness and violence with which an instrument is often grasped by the urethra, Mr. Hancock contends that elasticity will not account for this occurrence, and he endeavours to prove his statement by the following illustration. He says,—

"If we take a tube of India-rubber, for example, and draw its sides asunder from without, and then suddenly let them go, the tube will as suddenly contract to its original caliber; but introduce any body within the tube, capable of slightly stretching it as a bougie would the urethra, the action upon that body would not be sudden and grasping, as in the case of the urethra upon the bougie or catheter, but it would be at the same time gradual, yielding but adhesive, nor would the instrument be so firmly and, if I may use the term, solidly held as it is."

Again, he says: "If the contraction depended upon vital elasticity, that elasticity would develop itself in a certain degree of yielding, which we do not find to be the case." Now we cannot exactly concur in either the assertion or the illustration. Surely the contraction of elasticity must be sudden and strong, or gradual and weak, according to the degree and manner of application of the force which calls it into action. If an India-rubber tube be slightly stretched, of course the contraction that follows is proportionably feeble, but if the body stretching it be so large as forcibly to distend it, then the re-action is sudden and strong. In the case of the urethra, we deny that a small instrument is ever grasped with any amount of firmness anterior to the bulb; for any sensible seizure of the instrument by this part of the urethra to take place, the former must be sufficiently large to distend the canal, and then very often the grasping is, we are certain, due to the stretching of the orifice alone. But indeed Mr. Hancock's own remark is calculated to weaken his theory. He says, as already quoted:—"but introduce any body within the tube capable of slightly stretching it, as a bougie would the urethra,"—thereby making the admission, as it were, of the necessity to distend the canal for the production of the phenomenon under consideration. Now the argument natu-

rally arises, that if the urethra is really muscular, no stretching should be required; the impression of the instrument upon the lining membrane should, as in analogous instances, excite the contractile action of the tube. Waiving, however, this objection, and allowing that the urethra is furnished with muscular fibres, we yet think there can be little doubt that the firm grasping of the instrument so frequently experienced in some forms of stricture is due almost entirely to elasticity. Strictures of the description to which we refer are formed by the organization of lymph which has been effused into the cells of the sub-mucous areolar tissue, and those of the corpus spongiosum, thus forming an adventitious structure of highly elastic property. In order to enter these strictures we must press firmly against them, and when we have introduced the instrument, we find it grasped with a degree of tightness which, as far as we can judge, is no more than equal to the amount of force used in entering the resistance. If the stricture be long, of course the yielding is slow and gradual, the contraction is continual.

But while objections can be urged against the arguments which seem to favour the theory of the muscularity of the urethra, the positive statement of so many eminent microscopists cannot easily be upset by any negative assertion; and though, as before stated, most, if not all, the phenomena exhibited by the urethra in health and disease may be accounted for without recourse to the supposition of muscularity, still, there is no doubt but they are far more satisfactorily explained by admitting that theory. It is upon the positive statement of Mr. Hancock and others, however, that we could for a moment receive the doctrine he endeavours to establish, for to conclude, as some have done, that the urethra is muscular, upon no other grounds than that certain phenomena are more easily explicable upon that theory, is in our view highly unphilosophical.

In the second lecture,—that on normal micturition,—the author propounds several original views, which are very ably supported by analogical reasoning, and by reference to observed physiological and pathological facts. The part which the abdominal muscles play in the expulsion and retention of the urine, and the relation subsisting between the action of the bladder and the urethra, are the points principally considered. He differs most materially from Hunter, who inculcated that the urethra is passive while the bladder is acting. He says:—

"When we amputate the penis, removing the pendulous portion, the patient can still retain his urine, but he has no longer the power of ejecting it away from his person, down which it dribbles and drains

each time he voids it, a fact strongly disproving Hunter's theory of the passive condition of the urethra during the performance of that function; whilst the idea that the urethra acts in opposition to the bladder, serving as its sphincter, is also much weakened, if not altogether negatived, by the perineal operation for stricture; for here the opening in the urethra is made, sometimes as far back as the front of the prostate gland, but incontinence of urine is a very rare result."

Many other arguments, in support of his own theory of the combined and sympathetic action of the bladder and urethra, are put forward, and we particularly recommend those desirous of settling this very interesting topic to study particularly that portion of Mr. Hancock's lecture which treats upon it.

The third and last lecture comprises the consideration of affections simulating stricture, and of the real permanent form of that disease; and throughout the author's observations upon these subjects the same originality of views and diligence in research may be perceived. He says, in speaking of permanent strictures:—

"We find, notwithstanding the prevailing opinion to the contrary, that these strictures are formed in two ways: first, by the deposit of a false membrane upon the free surface of the urethra; and, secondly, by the thickening of the mucous membrane itself, the effusion of lymph into the subjacent cellular tissue and other structures, producing consolidation and thickening of the several parts, which, pressing upon the mucous membrane, push it inwards, and thus constrict the canal, diminishing its caliber. This latter is the usually described cause of permanent stricture; but from a very careful examination of many urethras, I am convinced that these affections depend upon adventitious membranes much more frequently than is commonly supposed, especially in those preceded by acute inflammation: and this not merely in that form recognised as a 'bridle stricture,' but in those of considerable extent and duration."

That a great many circumstances seem to favour the idea that stricture is sometimes produced by the formation of a false membrane within the urethra, we at once admit, but we cannot agree with the author as to the frequency of this cause of stricture; and indeed we incline to the belief that in these cases of exudation of lymph upon the surface of the mucous membrane within the canal, the stricture which remains after the symptoms of inflammation have entirely disappeared is chiefly due to interstitial deposit of lymph in the membrane itself. It is difficult to understand how, and contrary to analogy to suppose that, an unorganized layer of lymph should retain its connexions with the subjacent mucous membrane, and undergo alteration instead of

being cast off after a certain period, as we find to be the case in other mucous canals. We shall not, however, take upon ourselves to deny that what may be termed acute strictures are sometimes formed in the exact manner described by Mr. Hancock, but we conceive that his explanation of their formation will be found to obtain not so often as he has stated.

In fine, this work of Mr. Hancock's, though concise, contains much original and interesting matter; and we feel confident that the high character for professional ability which the author has for some time borne will be to our readers an inducement sufficiently strong, independent of our opinion, to give his views that fair and dispassionate consideration which they truly merit.

Om Sverges Endemiska Sjukdomar. Föredrag, hållet i Skandinaviska Naturforskare-Mötets allmänna Sammankomst den 21 *Juli*, 1851. Af D:r Magnus Huss. Stockholm: Tryckt hos Joh. Beckman, 1852. 8vo. pp. 131.

On the Endemic Diseases of Sweden. An Address delivered at the General Meeting of the Scandinavian Congress of Naturalists, on the 21*st of July*, 1851. By Dr. Magnus Huss.

There are few subjects the study of which is calculated to afford the physician more interest and instruction than disease in its endemic aspect; and there is probably nothing more important as a preparation for, or as an auxiliary to, attempts at sanitary improvement, so much sought after in the present day, than an attentive examination of the peculiarities of the soil, climate, and situation, and of the habits and occupations of the people, which lead to the preponderance of certain diseases in particular districts. Such investigations, adapted as they are to throw light on the origin and causes of disease, will likewise prove our best guides in the adoption of measures for its prevention and removal. And yet it is strange how few attempts have been made to collect and bring forward, in any systematic or connected manner, the results of observations on this important subject. In our own country, with the exception of the works of Rogers[a], Rutty[b], and Tuomy[c], and of de-

[a] An Essay on Epidemic Diseases, and more particularly on the Endemial Epidemics of the City of Cork. Dublin: 1734.

[b] A Chronological History of the Weather and Seasons, and of the prevailing Diseases in Dublin, with their various Periods, Successions, and Revolutions, during the Space of Forty Years. With a Comparative View of the Difference of the Irish Climate and Diseases, and those of England and other Countries. By John Rutty, M. D. London: Robinson and Roberts. 8vo. 1770.

[c] A Treatise on the Principal Diseases of Dublin. 1810.

tached papers by Speer[a], Maunsell[b], and others, but little has been done. Much valuable and interesting information is, doubtless, contained in Mr. Wilde's Report upon the Tables of Deaths attached to the Census of Ireland for the year 1841, and a similar Report for the decennial period ending with 1851 will shortly, it is hoped, appear; still, we consider that a comprehensive volume, in reference to Ireland, carefully drawn up on the plan adopted by Dr. Huss in the preparation of the work whose title is prefixed, is a desideratum, presenting as it would, in a connected form, the results of the experience of a large number of the practitioners of the kingdom.

Dr. Huss, already favourably known by his elaborate work on Alcoholismus Chronicus and by other writings, commenced the volume now under our consideration in consequence of a promise he had made at a meeting of the Association of Naturalists of Scandinavia, held at Copenhagen, in 1847, to add to the account of the epidemic diseases of the North given by the Committee which had been appointed for the purpose, a description of those which are endemic to Sweden. In order to accomplish this, he placed himself in communication with all the physicians in that kingdom, requesting from them an account of the diseases endemic in their several districts, and the information thus obtained he subsequently arranged and digested into its present shape. To facilitate a review of the subject, he divides the diseases into those which are confined to more limited districts, and those which extend more or less generally over the entire country. In describing the former, he follows the distribution of the kingdom into provinces, the name of a province, with its latitude and longitude, standing at the head of each division of this portion of his work. Of course, we can only briefly glance at the more striking of his results.

Among the inhabitants of the most northern province of Sweden, *Conjunctivitis* is so decidedly endemic as to give rise to the saying, "blear-eyed as a Laplander." This the author attributes to their spending the winter in an atmosphere of smoke, which only escapes from their huts through a hole in the top, and to their subsequent exposure during the spring to the constant glare from the snow on their forestless mountains. During the summer the younger Laplanders for the most part recover entirely; but it is rare to find an old person whose conjunctiva is not more or less reddened, swollen, and granular, on the inside of the lid.

[a] On the Diseases of the Lower Orders in Dublin. Dublin Hospital Reports, vol. iii. p. 161. 1822.

[b] Notes upon the Medical Topography and Diseases of a District of the County of Donegal. Edinburgh Medical and Surgical Journal, vol. xxxiv. p. 273. 1830.

The inhabitants of the sea-coast of Norrbotten, in the same latitude as Lapmark, viz., from 65·5 to 69·4, are infested with *Tænia;* this parasite becomes less frequent as we go inland, and almost entirely ceases at a distance of eight or nine miles from the coast. It is so common among all classes of the population that, according to Dr. Wretholm, there is scarcely a family which has not one or more members affected with it; and Dr. Waldenström states, that he has found it in children at the breast, who had never used any food but their mother's milk. The tænia lata is the species most generally met with, the occurrence of the tænia solium being exceptional.

The universality of the occurrence of tapeworm in this district is generally attributed to the nature of the food, the ordinary diet of the peasantry consisting of salt fish, unleavened barley bread, and milk, the latter being for the most part used sour: the Lapland mountaineers, who consume meat almost exclusively, never suffer from it. The popular belief is, that it is hereditary. Diet and mode of life, however, observes Dr. Wretholm, cannot be the only causes, for the peasantry who dwell close to the foot of the mountains are under similar circumstances as to food, and yet suffer incomparably more rarely from tænia than those whose habitations adjoin the sea-coast; and wealthy individuals, dwelling in the latter situation, and whose diet is of course far superior, are as liable as the lower orders to suffer from these troublesome parasites. Dr. Wretholm attributes the tendency to breed tænia to the nature of the soil, and of the water used as drink. In the highland districts, where the water is good and pure, tapeworm is almost unknown; in the lowlands, on the contrary, where the water is impure, derived from marshy and muddy sources, and consequently containing a quantity of extractive matter, having a disagreeable taste, and passing rapidly into putrefaction,—all ranks, conditions, and ages, and both sexes, universally suffer from it.

The inhabitants of the woody districts of Westerbotten (West Bothnia) and Norrbotten suffer much, especially in the autumn, from *Rheumatic* affections. After winter has set in the tendency to such attacks ceases. Their prevalence during the autumn is owing not only to the chilly fogs of the evenings and mornings at that season, but also to the occupation of the people during the latter half of August and the whole of September, viz., mowing the sedge which grows in the marshes, to accomplish which they are obliged to work standing in water, reaching half-way or more towards the knee. The general and traditional treatment employed by the peasantry in such cases

is the application of a moxa, made by burning amadou on the seat of the pain.

A remarkable circumstance connected with the province of Ångermanland is the gradual disappearance of two diseases which were endemic to it at the close of the last and during the first quarter of the present century, namely, the *Radesyge* or *salt flux*, and the *Spetälska* or *elephantiasis*. Of the former there has not been a single case during the last two years at the Government Hospital at Hernösand, while there were forty-four in 1826, and forty in 1827. From 1780 to 1800 the patients in this hospital were almost exclusively affected with this disease. Its disappearance is attributed by Dr. Lénström to the increasing prosperity of the peasantry, and their consequently improved mode of life, and to the efforts made by the government in the erection of dispensaries for its extirpation, both in this and other districts.

The formidable disease called *Spetälska* has also, without any assignable cause, almost completely disappeared. It was hereditary, although there were examples of its occurrence independently of hereditary tendency. The popular opinion was, that it was caused by the use of the so-called grey salmon as food, that is, the salmon which during autumn is returning to the sea, and is emaciated, impoverished in blood, tough, and sickly tasted. This disease, the *spedálskhed* of the Norwegians, —*spedalsked* of the Danes, shown by Drs. Danielssen and Boeck to be almost identical with the elephantiasis Græcorum, now happily disappearing from Sweden,—is, we understand, increasing fearfully in Norway. According to Dr. Platzman it is decidedly hereditary, being during centuries transmitted from generation to generation, but not contagious; so far from being so, a husband will not take it from his wife, nor *vice versâ*, although they occupy the same bed. In Helsingland it seldom occurs before twenty-five or thirty years of age; five-sixths of the patients are men; its course is tedious, so that its victims frequently drag out a miserable existence during twenty or thirty years before death closes their sufferings. The cases which occur here belong to the tubercular form of the disease. It appears to be incurable. The only remedy which Dr. Wikblad found to restrain its progress, assuage the sufferings it produces, and improve the character of the sores and their discharges, is creasote, employed both externally and internally. It is inherited principally from the father, so that if a spetälska woman marry a sound man the children are rarely affected.

Jemtland is so healthy, in consequence of its elevated si-

tuation, fresh alpine breezes, abundant water-draughts, and immense old forests, as to cause one of its physicians to declare that "it has no climate for doctors."

In and about Fahlun, the chief town of Dalecarlia, *Goitre* is endemic. It attacks females exclusively, generally between the thirteenth and sixteenth years. It most frequently does not attain a height sufficient to injure the general health, but sometimes the swelling extends so far as to surround the entire neck, and descend over the sternum, causing more or less severe and troublesome obstruction both to the respiration and the circulation. It is for the most part easily removed by the ordinary treatment,—the external and internal use of the preparations of iodine. Its frequency is to be attributed to the fact of this district being surrounded on all sides by hills and mountains, impeding the perfect changing of the atmosphere, and probably also from the presence in the latter of sulphurous acid fumes derived from the numerous furnaces for roasting copper ore. No report is given as to the nature of the water used as drink, though this would be important in connexion with the investigations which have been carried on in reference to the subject elsewhere. In this locality *bronchitis* and *phthisis* are also prevalent, probably owing to the sulphurous impregnations just alluded to.

The only part of Sweden where *Dysentery* is endemic is also in Dalecarlia, viz. on the banks of the great lake Siljan. In the marshy tracts formed by the opening of the deeper valleys, towards the lake, and which are liable to inundation, dysentery occurs regularly every August and September. The violence and extent of this affection vary, however, in different years. In later times, the years 1839, 1840, 1842, and 1845, have been those which have brought the severest visitations. In the months of August and September, 1839, out of a population of 138,000 persons, 2043, or 1 in 67, died of dysentery, according to the official reports: of these, 146 were under one year, 676 were between one and five years, 442 between five and ten years, 347 between ten and twenty, and 432 were above twenty. The mortality was thus greatest during childhood, and this, according to Dr. Wettergren, is usually the case. The more the disease assumes an epidemic form, the more malignant and fatal it is; and it then appears especially to leave a tendency to after-affections, such as rheumatism and dropsy. The mortality is, however, increased by insufficient medical supervision, and by the predilection of the sufferers for the popular remedies for this disease, of which the most favourite is powdered brick. Dysentery is more preva

lent in abundant years, probably owing to the large quantity of porridge then consumed by the peasantry, and to the increased use of ardent spirits.

The parish of Orsa, in this province, is, it would appear, the only locality in Sweden in which *acute and chronic chest affections* are endemic: those most common are *chronic bronchitis and phthisis.* The cause is the employment of the people in the manufacture of grindstones from several varieties of sandstone, during which operation minute particles of sand are drawn into the air-passages. These affections are called by the people, who well know the origin of them, "chest disease," "grindstone disease," or "Orsa disease." Boys who enter the mines between twelve and fifteen years of age become so much affected between their eighteenth and twenty-fifth year that they are obliged to give up the occupation, and for the most part die before they attain their thirty-fifth year; those who begin later may reach the age of forty-five, fifty, or even fifty-five years; but this depends on the greater or less perseverance with which they pursue their calling. From the 1st of October until the middle of November they stay in the mines, during which time they live on salt and dry food, herring, and hard bread; they also use brandy in large quantity, and drink abundantly of the water found in the mine; this is agreeable to the taste, refreshing, and perfectly clear, but when allowed to stand in a glass the latter becomes coated with a saline pellicle, proving that the water is highly calcareous. After the labour in the mines has been completed, and the blocks have been brought up, the cutting commences, and is pursued uninterruptedly from the beginning of December to the end of March. It is performed in small apartments, built for the purpose, in which generally eight or ten people sit together. To avoid the cold, these apartments are kept closed, and are consequently filled with the fine dust from the stones, which floats about like smoke, and is incessantly inhaled by the labourers. The amount of this dust has latterly been diminished by wetting the stones. The most diligent of the workpeople labour from 3 or 4 in the morning until 10 or 11 at night, and when they rest during the day lie down on the ground, which is covered with the dust from the stones. From April to the end of September these stone-cutters are occupied, like the other peasantry, in agriculture. Pulmonary affections set in in these labourers during the first, second, or third year, or later, according to their constitution, predisposition, and diligence at work. The first symptom is a feeling of oppression in the chest; the breathing becomes short and puffing; the voice becomes hoarse; there

is little or no cough; emaciation commences. If, during the first stage, the occupation be given up, the patients may in some cases be restored to perfect health, but in many the disease will continue notwithstanding such a change of habits. The second stage is characterized by increased difficulty of breathing, frequently producing orthopnœa; the cough increases; there is seldom much expectoration, although the mucus can be heard to rattle in the chest. Anasarca now sets in, followed by ascites and hydrothorax, and death by suffocation often occurs suddenly and unexpectedly. This disease, in the absence of stethoscopic and anatomical investigations, would seem, from the account furnished by Pastor Sernander, from which the foregoing particulars are taken, to consist in a chronic inflammation of the bronchial mucous membrane, which, no doubt, excites in those predisposed to it the formation of tubercle. During the last ten years the population of the parish of Orsa has been about 4000, the average yearly mortality 77, of which number of deaths 14, or 1 in $5\frac{1}{2}$, have, on the average, resulted from the stone-cutter's disease. This mortality is less than formerly, for during the decennial period 1820–30, the population being 3800, the yearly deaths were 83, of which, on an average, 18, or 1 in $4\frac{1}{2}$, were from the pulmonary affection above described.

Various writers have alluded to similar destructive effects produced by the inhalation of pulverulent matter in stone-masons, miners, coal-heavers, &c., and it is scarcely necessary to remind the English reader of the unfortunate fork-grinders of Sheffield, who, according to Dr. Knight, "grind dry, and die from 28 to 32 years of age."

Upland.—During the last century, and the first decennium of the present, *Nervous fever* was endemic in the city of Upsal, and obtained the name of Upsal fever[a]; but from the descriptions we have of it, it does not appear entitled to be considered a peculiar disease, but to have been what is now denominated nervous or cerebral fever. The cause of its former frequent occurrence, particularly during summer and autumn, seems to have been the situation of Upsal, surrounded as it then was by marshy tracts of stagnant water. Since these have been removed, the fever has ceased, and nervous fever does not now occur more frequently in Upsal than elsewhere.

Croup is endemic in the southern parts of Wermland and the northern part of Dahlsland about the river By; it is most frequent between the first and third year, it occurs only exceptionally after the sixth; of 9 attacked with it, 7, generally speak-

[a] Febris Upsaliensis; sub præsid. C. Linnæi, pr. gr. Ds. A. Boström, 1757.

ing, are boys; strong and well-fed children are equally as liable to it as the weaker and badly cared; scrofulous children do not suffer more frequently than others; the same child will often be attacked at the same season of two or three successive years. Drs. Ekegréen and Segerstedt consider the disease to be infectious. "Dr. Segerstedt," says the author, "gives a melancholy example of communicated croup which deserves to be mentioned. A physician recently come to the locality denied the possibility of croup being conveyed by infection: to prove the correctness of his opinion he placed his own son, a healthy boy of about three years' old, in the same bed with a child labouring under the disease; the previously healthy child took croup on the following day and died. The unhappy father, overcome with grief at the lamentable result of the experiment, died soon after. If this example," adds Dr. Huss, "stood alone, it would prove but little; but since many other cases of croup communicated by infection have occurred, the opinion of these physicians ought not to be rejected,—that croup in their district has shown itself capable of transmission by infection." Although no one in this country will, we believe, be found to maintain that croup is contagious, yet there are none who would not strongly condemn the folly of the above insane experiment.

Dr. Ekegréen states, that among the families he attends, 75 per cent. of the children have had more or less severe attacks of croup during the first six years of their life. The disease occurs almost exclusively between the beginning of November and the middle of May; it appears only when the north or east wind has prevailed for some time, never during the prevalence of a southerly or westerly wind; the disease is confined to a circuit of about two square miles[a], situated on the banks of the river By at its opening into the Wener lake, and on the shores of the lake as far as Åmål, a district forming a lowland plain almost entirely free from wood, and much exposed to the north and east winds, and contrasting strongly with the interior of the country, which is hilly and well wooded.

In Bohuslän the *Spetälska* was very prevalent at the end of the last century, and it is remarkable that after the cessation of the great fishery, at the beginning of the present century, this disease commenced to show a marked decrease, and may now be considered to be perfectly extinct. The *Radesyge*, or salt flux, on the contrary, still remains as an endemic disease,

[a] The Swedish mile is equal to six and a half English miles.

although it also has so much diminished that we may look forward to the possibility of its future disappearance. This disease has recently been ably examined by Dr. Kjerrulf[a], and as it is but little known, the author gives an account of the conclusions deduced by this writer from his investigations.

Dr. Kjerrulf considers that several diseases have been incorrectly included under this designation. That which he assumes as the proper disease he calls the subcutaneous radesyge. It is a disease of the coast. Limiting the denomination, as Dr. Kjerrulf does, the annual number attacked by it is about 30 in a population of 150,000, that is, 1 in 5000. If the allied cutaneous diseases be included, as they are by many, for example, by Dr. Hjort of Christiania, the proportion amounts to 1 in 1500.

The subcutaneous radesyge attacks all ages, those between 20 and 30 are, however, most liable to be affected. Women suffer from it more frequently than men, in the proportion of 6 to 4. It is neither contagious nor hereditary. The most commonly assigned cause of its occurrence is the large consumption of fish,—the poorer population living almost exclusively on fish and potatoes, and using dried fish instead of bread; the fish, too, is often of bad quality. There is no doubt, however, that a scrofulous habit predisposes to the development of the disease in persons exposed to its exciting causes, such as residence on the coast, the use of bad fish, insufficient protection against the changes of temperature, want of cleanliness, &c.

The radesyge has a premonitory stage which, according to Dr. Kjerrulf, "may last for weeks or months, or even an entire year. This period is characterized by undefined flying pains, occurring almost daily, through the whole system, sometimes attended with sudden sensations of pain in the back, or transient rending pains in the limbs; finally, after a period of uncertain duration, the pain becomes fixed in some part of the bony system. The situations in which it generally settles are—in women, one half of the cranium, and in men in some of the cylindrical bones of the extremities. The pain is always more troublesome towards evening and during the night, and becomes mitigated towards morning. When the cylindrical bones are attacked, the periosteum in the seat of the pain swells, the swelling either passing into suppuration, with the destruction of a limited portion of the subjacent bone, or, what is more usual, the swelling recedes, the pain diminishing, or more frequently ceasing altogether, whilst a number of small tumours, or so-called tubercles, become developed in the subcutaneous

[a] See the "Hygiea" for April and May, 1850, pp. 193 and 251.

areolar tissue. These tubercles are either isolated or in greater quantity, most frequently in the neighbourhood of the part where the pain had previously fixed, but also in other more or less remote parts. The disease is now fully formed. The tubercles, which are situated beneath the skin, the latter moving freely over them, become hard, and increase in size; they may become as large as walnuts; after a variable period they begin to soften, and attach themselves to the skin, which becomes red, and at last gives way with the formation of a round ulcer, which increases in size without altering its form, has hard edges, and is scarcely sensitive to the touch. After some time the ulcer begins to heal, fills from the bottom, its edges approach, and finally close, leaving a white shining cicatrix, the skin being immovable and uneven on the surface. These tubercles, which are found on many parts of the body, even including the mucous membrane of the mouth and throat, do not undergo these changes simultaneously, but exist in various stages in different situations. Their formation is evidently connected with some morbid state of the system, and only ceases when the general health becomes re-established."

Those who have once had radesyge are not liable to a second attack. Dr. Kjerrulf says, that those who have, or have had, this disease never become consumptive, and patients labouring under it are during its continuance exempt from agues, measles, and scarlatina. It is said that hump-backed people, and those affected with cancer, are never attacked by it, although cancer very frequently occurs in elderly women who in their youth have had the radesyge. This disease also is diminishing in the frequency of its occurrence, probably in consequence of an improved mode of life among the lower orders, who are especially its subjects. The derivation of the term radesyge is not very clear; it probably signifies a disease to be shunned or abhorred, from "ræd," *fearful*, and "syg" (Danish), *sick*. From the description given of the disease, it appears closely to resemble, if not to be identical with, that known in the West Indies as the framboesia or yaws, and in Scotland as sibbens, or sivvens.

Marstrand, an island a mile[a] distant from the main land, and consisting of a single rock of granite mixed with gneiss, only a small portion of it, which is occupied by the town, being covered by a thin layer of soil, and situated in 57° 53′ 46″ of northern latitude, presents some peculiarities of climate which might entitle it to be called the Madeira of Sweden. The south-west wind prevails here, blowing 280 days in 1000.

[a] Six and a half English miles, vide *ante*, p. 428, note.

The changes of temperature are not so sudden as on the mainland, while the average heat is greater. The mortality among the population of the town, which (exclusive of the fortress, occupied partly by prisoners and partly by a varying garrison), is 550, is exceedingly small. Pulmonary consumption is scarcely known among the natives of the island, and it appears to be remarkably arrested in such phthisical patients as sojourn there during the summer months, viz., from the beginning of June to the end of September. How the climate would affect strangers during the winter months remains to be proved, nor is such experience likely to be obtained, as it will scarcely be possible to induce many to spend a winter on this ocean-girt rock.

In Westergöthland chlorosis, scrofula, agues, and eczematous scabies, prevail. In three parishes, containing a population of 7000, there were, in the year 1838, 340 cases of *Chlorosis.* Dr. Heinrici states that, in the district about Ulricehamn, chlorosis occurs almost as often among the growing male population as among the female.

Twenty years ago *Amblyopia crepuscularis* was endemic among the pioneer corps in the fortress of Carlsborg, from ten to fifty or sixty men out of three hundred suffering from it at the same time; it was more prevalent in summer than winter, and appeared to be connected with derangement of the digestive organs, although no definite cause could be assigned for its occurrence. It continued prevalent until 1842, since which year it has gradually diminished. The author states in a note that the Prussian garrison in the fortress of Ehrenbreitstein was similarly affected without assignable cause in the months of July and August, 1834, no fewer than 138 soldiers having been attacked by night blindness.

Purulent ophthalmia has been for nearly forty years endemic in the parish of Wånga in Östergöthland. It appears to have been imported by two soldiers who were affected with it returning from the campaign in Germany in 1814. The disease is now becoming less prevalent.

Irritation or congestion of the brain, and *inflammation of the membranes of the brain* occurring in children under the age of five years, are endemic in a limited district, including the town of Carlshamn and the vale of Asarum. This is the only place in Sweden where such a tendency prevails, and the physicians who have written on the subject entirely refrain from any attempt to account for the endemic existence of these affections. *Laryngitis,* with or without bronchitis, and *Croup*, frequently prevail among children under nine years, at the same seasons (spring and autumn), when the tendency to

head affections exists. Dr. Huss supposes that the peculiar situation of the town may account for these affections. It lies nearly surrounded by hills in a valley which stretches down to the sea, and there being no rocks or other shelter at the coast, the sharp sea breezes rush up the valley, compressed between the hills, to the town. The consequence is, a tendency among the adult inhabitants to inflammatory diseases in general, and among children to inflammation of those parts which are most liable to be affected during the early periods of life, viz., the cerebral and respiratory organs.

Having reviewed the diseases which are found more or less endemic in limited districts of the country, the author proceeds to speak of those which are spread over the kingdom in general, although they may be met with more commonly in one locality than in another. These are, intermittents, scrofula, chronic gastritis, and chlorosis. The most northern boundary of the endemic occurrence of *Intermittents* may be considered to be 60° 40′ on the shores of the Baltic, and 60° in the more inland regions. They chiefly show themselves during the months of March, April, and May.

The same circumstance which was observed in many parts of Europe likewise obtained in Sweden, viz., that for some years after the visitation of cholera, intermittents ceased to exist epidemically. From 1834 to 1840 they only occurred sporadically; in the latter year they again assumed the epidemic character, but the disease has ever since appeared to be of a milder form, and less liable to be followed by unpleasant sequelæ than it was previously to 1834.

Scrofula extends as far as the sixty-third degree of latitude, but appears to be progressing still further towards the north. In the southern districts of Sweden scrofulous diseases are those most commonly met. Among the rural peasantry scrofula seldom attacks the lungs, but in the towns pulmonary consumption is extremely frequent. An opinion very generally prevails, that scrofula was rare until after the introduction of the cultivation of the potato, and that it has since extended in proportion to the more abundant production of this esculent, and to its employment by the poorer classes as an almost exclusive article of diet. Some also think that vaccination has tended to increase the diffusion of scrofula. This latter opinion is, however, evidently untenable, as numerous experiments by Lepelletier, Goodlad, and others, have fully demonstrated that scrofula cannot be communicated by inoculation.

Dyspepsia (pyrosis, chronic gastritis, cardialgia) is the most common affection in Sweden, and has been located there as

far back as medical records reach, although the frequency of its occurrence has much increased within the last eighty years. The cause of its being so commonly met with evidently lies in the nature of the diet of the people, consisting in general of large quantities of porridge and potatoes, with the addition from the animal kingdom of little else than salted fish and sour milk, the almost exclusive drink being badly brewed beer, which has most frequently passed into the acetous fermentation. Two not less important additional sources of these affections, however, exist, viz., in men the abuse of ardent spirits, and in women an inordinate consumption of coffee.

Chlorosis is a new disease among the Swedes, having appeared in some places twenty, in others fifteen, ten, or eight, years ago. Wherever it has once appeared it has generally with time become more and more diffused among the rising generation. Its most prominent symptoms are, general debility and paleness of face. Females between the fourteenth and twenty-fifth year are most liable to it. Although the great majority of chlorotic patients are unmarried, married women are not wholly exempt, especially if they have married too early, or have had the disease before and been imperfectly cured. It also attacks, but less commonly, boys between fifteen and twenty. In some places the physicians report that it affects both sexes with equal frequency, in others, that it is rare among males, and in others, that it is confined to the female part of the population. As probable causes of the increase of chlorosis in Sweden, the author alludes to the greater tendency of the female part of the population to remain within doors, in consequence of their now taking less part than they formerly did in the open air occupations of the men; their changing the warm Swedish clothing, which was adapted to the climate, for foreign goods or domestic textures of thinner description, incapable of affording sufficient warmth; and the abuse of coffee, which has been proved, when long continued, to have an injurious effect on the composition of the blood, diminishing its nutritive qualities, relaxing the nervous system, and producing, particularly when combined with want of sufficiently nourishing food, general debility. In no country in Europe is so much coffee used in proportion to the population as in Sweden.

Hereditary weakness in consequence of habits of intoxication in the parents is, however, according to Dr. Huss, the principal cause of the increase of chlorosis in Sweden. The abuse of blood-letting from popular prejudice is an auxiliary cause. Dearth in a district increases the number of cases. That the strength and growth of the Swedish youth have diminished of late years is proved by the results of the yearly

musters of the entire male population at the age of twenty-one. A comparison of the muster held in the year 1838 with that which took place in 1847 shows an increase in the latter year of those rejected from feebleness as unfit for military service of 1·4 per cent, while the number of those rejected in 1847 for being under the standard height of five feet five inches was 2·2 per cent. greater than in 1838. This military service, too, consists in but fourteen days' exercise at the finest season of the year. In 1838, of 24,118 youths, aged 21, present at the muster, 1214 were rejected for general debility, and 2075 for being under the standard; in 1847 the corresponding numbers were, 28,740, 1858, and 3098. In the entire period of ten years 16,695 were rejected for general debility, and 36,820 for deficiency in height. The author contemplates with horror the probable consequences of the intermarriage of these 16,000 Swedish youths rejected for infirmity with an equal number of chlorotic females. A probable cause of this deterioration, which the author appears to overlook, is emigration. We are not sure whether emigration has as yet been extensive in Sweden; up to the year 1839 the population was very rapidly increasing, but it is not likely that the country can long withstand the influence of the discoveries of gold in so many and distant parts of the world, designed as they evidently are to distribute the human race more equally over the surface of the earth, and it is well known that the majority of emigrants consists of the stronger, more active, and more energetic members of society, while the weaker and more puny remain behind. Such has been the effect of emigration in Dublin, that it is now found difficult to obtain men sufficiently tall to recruit the ranks of the Metropolitan Police; but in this force the standard height is five feet nine inches, English, while for the Swedish muster the necessary height is but five feet five inches, Swedish, which, as the Swedish foot is only 11.684 English inches, is equivalent to little more than five feet three and a quarter inches of our measure. Another difficulty now experienced in selecting men for the Dublin Metropolitan Police is to get persons of sufficient education: many of those chosen as physically suitable are obliged to attend a school for the purpose of learning to read and write before they can be allowed to enter upon their duties. The great abuse of alcohol, to which the author mainly attributes the deterioration of the Swedish race, commenced with the establishment of the crown still-houses under Gustavus III., which sent a flow of brandy through the land. The quantity of brandy consumed in Sweden was still further increased by the revival, towards the close of the same monarch's reign, of the right of private dis-

tillation for domestic use. At the present time from twenty-two to thirty millions of gallons are made in Sweden,—some calculations go so high as thirty-seven millions,—and as little or none of this is exported, and the population of the kingdom amounts but to three millions, it follows that each individual's share amounts to from seven to nearly nine gallons, or, subtracting one-half for such women as do not use brandy, and for children, it may be stated in round numbers, that each man consumes yearly from fifteen to twenty gallons,—a truly enormous consumption. According to information furnished by Mr. G. R. Porter to the Statistical Section of the British Association, "it would appear from authentic returns that the average quantity of home-produced spirits and rum annually consumed by each adult male (the women and children being reckoned as *nil*), is—two and a third gallons for England, three and a half gallons for Ireland, and no less than eleven and a sixth gallons for Scotland. It is to be remembered that a large consumption of malt liquors takes the place of spirits, in great degree, among the labouring population in England, and that in the middle and higher classes brandy is more commonly employed than whiskey and rum, while the preference of the Irish population for malt spirit is nearly the same as that of the Scotch."

The author proceeds to describe the consequences of this abuse of ardent spirits amongst his countrymen under the heads of:—1. Depression of the bodily powers and arrest of development; 2. Spiritual degradation; 3. Poverty and want; 4. Disease and untimely death; 5. Insanity and suicide. Among a population of little more than three millions, 1070 suicides took place in the five years from 1836 to 1840, while 1087 occurred during a similar period from 1841 to 1845: of the former number 867 were men, and 203 women, and of the latter 870 were male, and 217 female. 6. Crime and imprisonment.

The proportion of suicides is large, being one annually among 13,953 inhabitants. According to M. Quetelet, the proportion of suicides annually is, in—

Russia,	1 to	49182	inhabitants.
Austria,	1 to	20900	,,
France,	1 to	18000	,,
State of Pennsylvania,	1 to	15875	,,
Prussia,	1 to	14404	,,
City of Baltimore,	1 to	13656	,,
Boston,	1 to	12500	,,
New York,	1 to	7797	,,

The last three are cities, in which suicides are always more numerous in proportion than in a country at large, so that Sweden in respect of suicide is in a worse condition than any of the above-mentioned states.

The prevalence of the abuse of ardent spirits in Sweden is attributed by Dr. Huss chiefly to the state of legislation on the subject of distillation, which affords every facility to this manufacture, and thus places an intoxicating beverage within the reach of those possessed of the most moderate means, and to the laxity with which fines for drunkenness are enforced; and the author concludes his work with an appeal to the Swedish Legislature to tax the manufacture, sale, and consumption of brandy so as to render it as inaccessible as possible.

Probably the highest approbation we can bestow on Dr. Huss' volume is to repeat the expression of our wish that a similar work, as able and as comprehensive, might be brought out on the endemic diseases of Ireland. Nor do we think the matter unworthy the notice of Government; on the contrary, we believe that the country would soon be far more than repaid the expense of appointing a medical commission to correspond with two or three of the principal medical men in each district of the kingdom, and to analyze and arrange the large mass of information which would thus be elicited. A compendium of the results would, doubtless, form a most interesting and useful volume, instructive to the medical profession, and highly beneficial to the community at large; and of the feasibility of such an undertaking, Dr. Huss has supplied us with demonstrative proof in the volume now reviewed.

Military Surgery, or Experience of Field Practice in India, during the Years 1848 *and* 1849. By J. J. Cole, M.R.C.S.E., H. E. I. C. S., late Surgeon to the Auxiliary Forces during the War in the Punjaub. London: Highley and Son. 1852. 8vo., pp. 224.

This work, the author informs us in his Preface, "was written from practical experience in the field," when in medical charge of the troops serving under Major Edwardes' command in Mooltan. The cases detailed were selected from the wounded in the battles of Kuneyreh and Suddozam, in various skirmishes in the first siege of Mooltan, in the battle of Soorajkoond, and in the second siege of Mooltan, and comprised cases of every degree of severity, kind, and description. This certainly is a sufficiently practical source, one of those from

which we would wish to see authors always pen their observations, considering, with Sir Astley Cooper, "that it is more desirable that men should write what they *see*, than what they hear and read." We are glad, therefore, to give a short notice of Mr. Cole's book, and to speak favourably of some of the suggestions it contains.

The work consists of two parts, the first comprising preliminary remarks or general observations upon the nature of gunshot, punctured, and incised wounds; the second, the treatment of those injuries when affecting the various regions and structures of the body; between these two divisions are placed some sensible precepts, or general rules for practice in the field, with a formulary for the preparation of such medicines as the author found occasion to require, and to be useful in the medical treatment of the wounded. So far the arrangement is good; but when we come to the consideration of the individual cases, from which we anticipated instruction, we find them, as reported, sadly deficient,—so noticed, indeed, as to leave it a matter of doubt whether any individual one portrayed is the recital of an actual occurrence or an imaginary detail. Introduced hurriedly and left off abruptly, it is for the reader in almost every instance to draw his own conclusions as to what has been the ultimate termination of the case. Here is an example:—

"Case XXXIX.—*Gunshot Wound in front of the Neck, with Wound of the left common Carotid.*—I was standing near a small window with a European soldier, when a bullet came in and struck my comrade in the neck on the left side, divided the carotid artery, and passed downwards towards the chest. The soldier falls prostrate upon the floor, crying, 'Good-by, my friends.' There is fearful hemorrhage. Lose not a moment,—stand not an instant uncertain what to do,—throw yourself down by the patient, place your thumb upon the vessel as it ascends behind the clavicle; make pressure backwards and a little inwards, and keep it up until bleeding has wholly ceased, and the vessel secured. The common carotid can be easily commanded by pressure of the thumb. It is not, however, an easy matter to apply a compress with the same effect, and to enable a patient to be sent to the rear. In all probability he will die of hemorrhage on the way. The only safe plan is to tie the divided vessel above and below, immediately and upon the spot."

Having got rid of the whole subject of wounds of the head, neck, and trunk, in a space of twenty pages, our author says:

"I now pass to gunshot wounds of the extremities. Of these a few important examples must perforce suffice, as I cannot stop to describe all the cases I have witnessed.

"Case L.—*Gunshot Wound of the Hip.*—When a musket, rifle, or pistol bullet gets lodged in the parts about the hip, it is not always easy to form a correct diagnosis. It is not easy to follow the ball in its course, or to ascertain its whereabouts. Very often the surgeon does well in leaving the case to nature, enjoining rest and treating symptoms. There are, however, cases not a few wherein his skill is immediately needed, and cannot fail of benefiting the patient. The following case is one of these. The bullet struck with great force upon the upper part of the thigh, about two inches below the anterior superior spinous process of the ileum, and passed clean through backwards and a little outwards, smashing in its course the neck of the thigh bone. The limb is slightly shortened, turned out, and there is some bleeding from the wound. The diagnosis is clear enough: comminuted fracture of the neck of the femur cannot be mistaken. The treatment is also clear, and should as soon as possible be entered upon, without giving the patient unnecessary pain. Give two grains of opium and five of calomel immediately. Repeat the opium without calomel in fifteen minutes. If it fail to relieve pain, encourage the patient, and assure him that it is not necessary to take off his limb. When pain and irritation have in some measure abated, cut down upon the neck of the bone and remove its broken fragments.

"Case LXIII.—*Gunshot Wound of the Fore-arm.*—So far we have seen that the musket bullet, when propelled by powder, is very destructive of life and limb. Alas! a very small proportion of its wounds admit of complete recovery. The fore-arm, however, is by no means so readily destroyed by it; indeed, except where both bones are broken and comminuted, it is rarely necessary to amputate. Where one bone only is concerned, wait until suppuration is fully progressing, and then be guided by circumstances."

With such brief and cursory description is the subject treated. We should here dismiss our notice of Mr. Cole's work did we not feel it necessary to allude to the subject of chloroform, speaking of which our author becomes more than usually energetic, drawing the attention of military medical officers to the point especially, for the purpose of declaring it to be a highly pernicious agent in their hands. Why it should be so we are at a loss to know, but we shall permit our author to speak for himself. He says:

"I have used chloroform largely in cases I need not name, but in time of war, in the field of battle, on the bloody plain, or in the field hospital, it should *not* be found. No place should be assigned to it; leave it with the medical storekeeper; place it on a high shelf in his warehouse, and if the weather be hot, remove the stopper to keep it cool. I could with ease adduce fourscore cases to prove that chloroform is injurious in field practice, but one example shall suffice. One morning in going round I noticed a man whose stump was

being dressed, and was informed that a friend who was in the habit of coming to my assistance had amputated his thigh the evening before. I pointed out how well the operation had been performed, but added, feeling the patient's pulse, that he could not recover. Soon after, I met my friend, and said, 'I have seen your handiwork up there, and a better or cleaner stump I have not often noticed. You will not, however, save your man.' 'Indeed! why? he is a fine strong fellow.' 'Ah! but he looks as if he had taken chloroform.' 'Chloroform! we gave it him before the operation, and he did not suffer the slightest pain.' 'Did you? then your patient's hours are numbered.' He died before the evening."

Why death occurred in this case, or why it so invariably followed the use of chloroform in the author's hands, he does not inform us. We wish he had, for sweeping assertions, unsupported by reasoning or fact, have the effect upon our mind of making us set down such to prejudice, and do not lead us to regard them as the results of matured experience, sound judgment, or careful investigation. We *know* the benefits derived in civil practice from the use of anæsthesia, and we cannot see any reason why in the field hospital it should not equally be of use. The only cause assigned by our author for not using chloroform is, "that it renders the patient unconscious of pain, which is one of the most salutary stimulants known, bringing about re-action of the most natural kind when many approved measures fail." We hardly think any of our readers will be likely to suspend the use of this invaluable agent upon reasoning such as this. Our young friends who are about to enter the military ranks, and who have been educated in the hospitals of this metropolis, must have had too many opportunities of seeing its real efficiency tested, not to employ it in proper cases in their own practice; and if they will but adopt the precautions which they have been taught and shown to be necessary, we engage that they will find an equal immunity from danger in its use in the Punjaub or plains of India, as in our hospitals at home.

In taking leave of Mr. Cole's book, we would address a few words to our military and naval medical friends in general, requesting them and urging them to commit to print from time to time a notice of the valuable cases which come before them, and a record of the facts brought under their observation. No practitioners have the same opportunities of carrying out the treatment they adopt, of noting the progress of disease during life, or of steadily, leisurely, and for the most part conveniently, making examination of morbid structures after death. The journals afford a ready and inexpensive form of publication,

and insure to a great degree a wide circulation, as well as the opportunity for men in one part of the world knowing what their comrades are doing in the other.

The real point, however, on which the difficulty rests, of inducing men in public services to commit their experience to print, is the *cui bono*. We have often spoken privately to friends upon this head, and invariably received from them the same reply,—"Why should I write? What do you think I should get by it?" Nothing truly at present, but that system ought to exist no longer. Government should take the matter up, by offering, not medals, but good money prizes, to be adjudged to the best papers and practical essays on the injuries consequent upon warfare, and the diseases of foreign climes. The statistics of mortality, under their different circumstances, would be a guide to the actual operation of each man's work, and these essays, when printed, would form the most valuable guides subsequently for other medical officers in the service in those spots and identical situations whence previous experience had been gained. Acting upon the foundation of experience, from the moment of landing at any station regularly occupied by troops, we may infer that a greater success would attend the practitioner than if, as at present, he had to work, for some period at least, upon theory and the practice which he *may or may not* have gained elsewhere.

On a New Way of Treating Gonorrhœa. By John Q. Milton, M.R.C.S. London: Churchill. 1852. 8vo, pp. 103.

It must be a source of consolation to the junior members of the profession to know that there are few subjects in medicine or surgery of which our knowledge has arrived at such perfection that further observation can add nothing new or useful; hence, no matter what class of disease predominates in the practice of any surgeon, by a careful observation of individual cases, and inferences drawn from the aggregate, there is always an opportunity offered of adding something to the general fund of knowledge.

The subject which our author has selected is one offering a full scope for investigation and a fair field for improvement; for although we can in the majority of instances conduct a case by safe and ordinary means to a favourable termination, yet at times we shall find all our efforts unavailing to effect a perfect cure. Besides, there are many occurrences in the course of the disease yet to be explained, and many points on which authors

do not agree, or for which the explanation is not alone unsatisfactory, but even deficient. Hence we should gladly receive and favourably consider any work which professes to add to our knowledge of the nature of gonorrhœa, or to render its cure more certain.

There are two different modes by which additions to the literature of any subject in medicine may be made. The first, the most laborious, commences by considering the various morbid changes induced by the disease; the influence of constitution and time on these changes; the progress of the affection when left to take its course uncontrolled; the effect of treatment in each separate stage; what varieties of symptoms require a change in treatment; when and where the rules already adopted by previous observers may be applied; where they are defective, and how to be improved:—in short, by becoming acquainted with the various opinions and proposals for treatment which have been already advanced, to test them by the strict rule of practical experience; and from the collection of data thus obtained deduce general rules, which will explain the alterations occurring, and serve as guides for treatment. The second, much more easy and rapid, is to fix on some theory or plan of treatment, or even remedy, not before thought of, the more striking the better; adopt it without reason or argument; give no account of the facts or occurrences which led to its adoption, leaving the reader to infer that it was the result of some direct inspiration, and as such much superior to any conclusions from human argument; and then, adapting some few cases to suit the theory, present it to the world, in the futile expectation that it will be received on the testimony of the author alone.

Impressed with the great importance of distinguishing between these two different methods of acquiring knowledge, we take up the book before us, to which the author has fixed the captivating title, "A New Way of Treating Gonorrhœa," well calculated to attract the attention of the most casual observer, and to tempt the more inquiring to possess themselves of it.

On turning to the first page of the work we were somewhat surprised to find the author does not, like most ordinary observers, commence at the beginning, but, after the manner of epic poets, plunges at once "in medias res," or rather jumps to the last stage,—the treatment,—dismissing all previous considerations by the expression of the following sentiment:—"Were all other works to perish by one of those accidents which from time to time convulse society, Hunter's unequalled

monograph would always supply a chapter of symptoms, on which it would be impossible to improve." And although we are inclined to agree with him in part, still there are points in which we are sure Mr. Milton would differ from Mr. Hunter's explanations and assertions respecting gonorrhœa. We must, however, suppose each reader left to adopt his own theory and views of the symptoms and diagnosis of the disease; and no matter what his idea may be, he may tack on the "new way" of treatment to it. Of course the best plan to induce people to follow a "new way" is to find fault as much as possible with the old, to root it up, and show that it does not always lead to a speedy cure. To effect this, therefore, we have, in the first place, a review of the old remedies for the cure of gonorrhœa.

Before proceeding to the analysis of the treatment at present in use, however, Mr. Milton cannot avoid taking a fling at homœopathy. The method in which it is done, however, seems to us not to have much to recommend it, either in elegance of language or force of argument:—"One of those miserable exhibitions of buffoonery by which men attempt to gain a position they could never honestly attain to; a wretched cheat, and delusion fitted only for the brains of a bedlamite or a knave. Need I say that as a remedy it is as worthless as its proprietors and patrons?" Such language, we think, does no good. It would have been better to have passed by the subject in silence, as beneath notice, or to have alluded to it as founded on mere assertion,—totally devoid of any foundation.

We now come to our author's censure of the remedies ordinarily used in the treatment of gonorrhœa. These he divides into internal, external, and local. Copaiba, he asserts, sometimes sickens the patient, and sometimes fails to effect a cure. Turpentine possesses the bad qualities of copaiba, and is not so efficacious. Of cubebs he has little experience, and that not favourable. If with him we considered the antiphlogistic plan of treatment to "mean the indiscriminate application of a certain series of measures, such as the use of mercury, tartar emetic, digitalis, of blood-letting, leeches, and cupping, continued, with low diet, with a view of combating inflammation, totally irrespective of the structure primarily or chiefly invaded,"—we should also condemn it. Of the preparations of potash, the liquor, he says, sometimes effects a cure in conjunction with other remedies. The acetate has not answered his expectations. And of external remedies, the only one that has not disappointed him is the application "of very hot water to produce faintness and excoriation," in fact, scalding the penis!

Next come the direct or local applications:—"The disco-

verer of injections merits the deepest gratitude of the whole human race, and what he will not obtain, at least in England, a statue and an ovation." On this our only comment is that we fear the discoverer of the "new way" will be in the same predicament. Of all injections, however, he prefers the nitrate of silver, gradually increased in strength, to be used by the surgeon; and the sulphate of zinc to be used by the patient.

We now come to a remedy we believe to be a novelty, but not the "new way,"—the caustic plug, a piece of calico two inches long, three lines broad, steeped in caustic solution, and introduced into the urethra. We should, in our innocence, have thought, that had we desired to produce a very severe inflammation in the urethra, this caustic plug would have been one of the first methods to suggest itself.

So far of the remedies hitherto used in the treatment of gonorrhœa. The next section, headed "The proposed Plan of Treatment," commences by recommending, not the "new way," but that which is known as the abortive treatment, if the case be seen before inflammation sets in, viz., a strong injection of nitrate of silver, a large dose of calomel and of a purging draught, low diet, and rest. We suspect a little more experience would render our author cognizant of the evil consequences to which such very severe measures may at times give rise. If, however, the case is not seen at its commencement, or if the abortive plan fail, then we come to the culminating point of Mr. Milton's discovery, the "new way." "I wish to apply a new treatment,—internally, salts of potass and rhubarb,—hot water externally, with injections combined and graduated." "The solution I now employ is formed by pouring five ounces of boiling water on two drachms of powdered chlorate of potass, and then adding three drachms of the liquor potassæ, and three to five drachms of the acetate (this I call 'liquor potassæ compositus'). In order to obtain its full effects it must be combined with rhubarb, from five grains to a scruple."

After a due laudation of this *new* way, we are surprised to find that it is not quite perfect even with the aid of injections, for he tells us what to do "when this plan, properly aided by injections, *fails;*" and as we advance we think we perceive the odour of our old maligned friend, the balsam, very strong in the following mixture:—"Of all other remedies there is but one I should recommend where this plan, properly aided by injections, fails, it is, balsam of copaiba and liquor potassæ, of each three drachms; mucilage, an ounce; and peppermint water, six ounces; of which an ounce is to be taken three times a day."

In speaking of injections, like most original discoverers, he

must find fault with all former syringes, and gives us one of his own invention, "with a pipe at least one inch and a half long"!

This section concludes with a summary of the author's practice:—"First, try the abortive treatment; if it fail, or the case be seen too late,—second, try the new way now explained; this failing,—third, refer the case to gleet."

Having now exhausted his description of the new method, the three remaining chapters are devoted, one to scalding, one to chordee, and one to gleet—the receptacle for all previous failures.

That on scalding may be dismissed in a few words. The scalding is produced by the urine, but by which ingredient in it we are not quite certain; however, our author gives us a very learned disquisition about the different opinions respecting the component parts of this fluid, and the treatment recommended to modify any one ingredient. But as we know in the great majority of cases of gonorrhœa the urine is in a healthy condition, we cannot consider the surgeon justified in inducing a morbid condition of this fluid, in order to relieve a symptom which will disappear as the cure of the original disease progresses.

Of chordee our author has peculiar opinions: namely, that it consists in a spasmodic action of some long muscular fibres lining the urethra. But we doubt very much if this theory will explain the various symptoms attending on chordee. Fortunately, it does not much alter the treatment formerly in use; —a dose of camphor, with, perhaps, some opiate at night; to this, however, our author lays claim as a discovery.

We now come to the last section, that on gleet, the *refugium peccatorum* to which Mr. Milton sends all cases of failure—those which will not be cured by the "new way." The remedies for this stage of gonorrhœa he divides into—1. The attainable; 2. The unattainable; 3. The undiscovered. The last looks like a second new way, and consists in enveloping the entire penis in a blister; still, even this cannot exist alone, it requires the assistance of injections. Our author has not informed us what steps we are to pursue if all these means fail, and we suspect that even with him such an event may have occurred, as we are not informed to the contrary.

Having now given a brief analysis of the work before us, it will require but little penetration to perceive there are many deficiencies in it; that on rising from its perusal our knowledge on gonorrhœa is pretty much as it was before studying its contents; and that the rules for pursuing the old method of cure are laid down, with but little to aid the inquirer after a *new*,

or even a more efficacious, plan of treatment. When we come to examine the novelties we must view them with some suspicion. We have no account given of the mode of action of the potash, nor even a proof of its being of any advantage, since the injections constitute a very important part of the cure, and even the author himself almost admits its uncertainty. The rules laid down and enforced about injections are, we think, good, and likely to be of service. Still, the chief novelty here is the encouraging us to use them more frequently, and of gradually increasing strength. The novelty of the caustic plug is one which we suspect no surgeon would attempt without fear and trembling. The method of curing gleet has also very little to recommend it, either in novelty or, we suspect, in efficacy; enveloping the entire penis in a blister can be little more powerful than the former plan of applying iodine, or some such irritant, along the outside of the urethra, while it must add materially to the pain and annoyance of the patient.

The only point he alludes to of the many in which a difference of opinion exists amongst surgeons, he leaves very much as he found it:—"There are certainly grave doubts as to gonorrhœa being the cause of stricture. My own attempts to arrive at anything like a satisfactory conclusion on this point have utterly failed."

We have, in conclusion, only to express our regret that Mr. Milton did not bestow more time and attention on, and a more extensive plan of investigation into the subject of this disease: for from the knowledge of it which he evidently possesses, a little care and further experience might have added a useful work to surgical literature.

The Physical Diagnosis of Diseases of the Abdomen. By Edward Ballard, M.D., &c. London: Taylor, Walton, and Maberly. 1852. Fcap. 8vo, pp. 276.

The aid derived from physical signs in the diagnosis of disease has deservedly attracted much attention of late years, but hitherto special treatises on this subject have been almost exclusively directed to their consideration as applied to the diagnosis of diseases of the chest: we were, therefore, much gratified with the publication of Dr. Ballard's volume, which is a valuable addition to the medical literature of diseases of the abdomen. Although the author candidly avows that he has sought less "to announce new facts, than to generalize known phenomena," yet we do not think the less of him or

his work on this account, and we only wish that some of the many laboured writers whose works our critical labours compel us to peruse would follow his example, for as regards them, we often feel inclined to concur in the witty but just observation of D'Alembert, "l'Auteur se tue à allonger, ce que le Lecteur se tue à abreger."

Dr. Ballard's work is divided into three parts: the first of which is directed to a brief description of the method of making a physical examination of the abdomen, and of the results thereby afforded in health and disease; this consists in inspection, measurement, palpation, percussion, and auscultation. In the second part those diseases of the abdomen which furnish indications of their presence in physical examination are considered *seriatim*. A very important physical sign, probably to the Dublin School one of the most interesting, is here described, namely, that termed the friction sign, which has been variously described as "a soft, creeping, or gentle vibration under the hand," or as like the sensation given to the "finger rubbed over a pane of glass;" while the more intense degrees have been likened to "creaking," "crepitus," and "grating." This sign was first observed and described as available in the diagnosis of peritonitis by Professor Beatty in our First Series[a], and supposed by him to be caused "by the rubbing together of opposing surfaces of the peritoneum, which have become rough from deposition of lymph;" and this theory was demonstrated to be correct by Dr. Corrigan in our ninth volume of the same series; but we do not find that the author alludes to, or seems to have been aware of, these researches. Although his observations as to the physical diagnosis of aneurism of the abdominal aorta are well drawn up, we cannot agree with the statement that the "murmur accompanying the systole is blowing, but sometimes rough and friction-like;" as in most of the cases which we have examined we have generally found the murmur to present a peculiar harsh, rough sound, nor does the author seem to be aware of its being almost invariably present, a fact which we regard as of great importance, particularly in contra-distinction to its value as significative of aneurism in the thoracic aorta. A curious case is narrated here of cancer of the vertebræ, causing abdominal tumour with strong pulsation and rough murmur over it. In the third part of the work the most remarkable physical signs of abdominal disease are re-enumerated, and attached to them are notices of the morbid states by which they may be produced; these are arranged in a linear series, under the

[a] Vol. vi. pp. 145, 146.

heads of definite physical conditions, so that the practitioner can thus review at a glance all the diseases to which any physical signs are common, and compare them with those presented by the case before him.

As Dr. Ballard's work is one which from its nature does not admit of analysis, we shall only add, that we have no hesitation in recommending it to the notice of our readers as a valuable summary of all that is at present known regarding the physical signs of diseases of the abdomen.

Afhandling om Sättet att besvara Rättsmedicinska Frågor rörande Hafvandskap och Förlossning. Af ALFRED HILARION WISTRAND, M. D. &c. Stockholm, 1849. P. A. Norstedt & Soner. 8vo, pp. 95.

A Treatise on the Mode of deciding Medico-legal Questions connected with Pregnancy and Delivery. By A. H. WISTRAND, M. D.

IN the prefatory portion of his work the author informs us that he was induced to select this inquiry as the subject of his treatise, chiefly to bring forward in a connected manner the results of numerous special investigations he had made into the changes of form and condition which the sexual organs, and particularly the os uteri, undergo as a consequence of pregnancy and delivery. The importance of the subject is shown by reflecting on the magnitude of the interests which may be involved, and the temptations which occasionally induce females to exert all their powers of dissimulation and cunning to deceive the physician, and to feign or conceal a state of pregnancy or of delivery for the acquirement, on the one hand, of certain rights or advantages, or in order, on the other, to escape the degradation, loss, or punishment which may be the consequences of detection. It is thus most necessary for the practitioner to be well acquainted with the principles which are to guide his decision,—a decision on which not only the honour of individuals, but the weal or woe of entire families may depend.

The Swedish laws which may render such medico-legal investigations necessary are those relating,—1. To marriage; 2. To inheritance; 3. To crime; and 4. To punishment. Of these it cannot prove uninteresting to our readers to give one or two examples.

Under the ninth head of the third chapter of the laws of

marriage it is enacted, that "if a man debauch his betrothed, it is a marriage, which he is bound to ratify with a wedding ceremony, whether the betrothal was accompanied by conditions or not, and, in the former case, even if the conditions have not been fulfilled. Should he obstinately refuse, the woman shall, without such ceremony, be declared to be his lawful wife, and shall, as such, enjoy full rights in his house."

In reference to punishment it is enacted, that "if a woman condemned to death or corporal punishment be pregnant, the sentence may be suspended until six weeks after her delivery shall have taken place."

The foregoing are the first and the last but one of twenty-five laws and royal ordinances quoted by the author, and will serve to give an idea of the nature of the others.

The medico-legal questions suggested by Swedish legislation on the subject of the treatise before us are reduced to the following seven, each of which forms the heading of a separate division of the subsequent part of the volume:—

1. Is a woman pregnant or not?
2. At what time was a fœtus *in utero* or a child already born conceived? or at what period of pregnancy is the mother?
3. What is the duration of utero-gestation in the human female? or what is the longest or shortest time at which a woman can give birth to a living and viable child?
4. Can a woman be impregnated while in a state of unconsciousness, and thus be ignorant of her pregnant condition?
5. May pregnancy exercise such an influence on the mental powers, as to render a woman incapable of controlling her passions?
6. Has a woman been (recently or at any time) delivered? and when has she been delivered? or can it be ascertained by examination at what time a past delivery has taken place?
7. May a woman without being aware of it give birth to a child? or may she in consequence of delivery be reduced to such a state of unconsciousness as to be unable to take due care of her offspring?

In considering the first question in the foregoing series the author discusses twelve signs of pregnancy, which it is scarcely necessary for us to enumerate. The only one of these which can, he states, be looked on as *by itself* wholly conclusive of the existence of pregnancy is the sound of the fœtal heart, and even this has not a corresponding negative value, for its absence may depend on the position or the death of the embryo.

Among the phenomena which attend pregnancy previously to the fœtal heart becoming audible, or before the motions of

the child are perceptible, that which is considered by Dr. Wistrand to have the greatest value as a basis for an assumption of the probable existence of pregnancy is the livid or violet colour presented by the labia majora, the nymphæ, and the vagina, which he states to be very characteristic. This is generally most evident on the inside of the nymphæ, about the clitoris and the orifice of the urethra; it is less distinct on the inside of the external labia. The change of colour never follows the course of the veins, but extends nearly uniformly over the entire mucous membrane, and may thus be distinguished from the redness frequently met with in women who have a varicose condition of the genital veins, which redness for the most part follows the subdivisions of these vessels.

The alteration of colour evidently depends on the hyperemic congestion produced in the uterus and other genital organs by pregnancy, through compression of the utero-pelvic veins. It generally begins to be perceptible towards the close of the second month, and becomes more evident during the third and fourth months. Malvani states that it is a never-failing sign of pregnancy, a statement which Heiberg, Sperino, and others confirm; and Huguier asserts that it is not found in any other condition than pregnancy, and that it never occurs in morbid congestive enlargements of the uterus. Lange, on the other hand, contends that this phenomenon does not occur in all pregnant women to such a degree, or so plainly, that it can be decidedly distinguished from a somewhat similar change of colour which may depend on some pathological condition of the unimpregnated uterus.

The author believes this to be the most certain sign the medico-legal inquirer can obtain of the existence of pregnancy during the earlier periods of this state (from about the seventh to the fifteenth week). We think that he greatly overrates its importance: it is at best only a difference in degree, and it would be absurd to rely on it, and probably no two people could be found who would agree as to the shade of colour. This the author himself, notwithstanding all the stress he has laid upon it, almost admits, for he adds, that this sign "will only enable us to arrive at a probability, which will be more or less confirmed by other coexistent phenomena, never at perfect certainty, which is not attainable until a later period of pregnancy."

In cases in which delivery has already taken place, and where birth has been given to a child, whether immature or at the full term, and where an examination of the fœtus can be obtained, to assist, in the decision of the second question—the

age of the fœtus, or the time which has elapsed since conception—we have, appended to a description of the phenomena presented by the mother during each month of pregnancy, an ample and carefully drawn up tabular view, after Briand and Brosson, of the development of the embryo at nine different periods between the sixth week and the completion of the ninth month.

In reference to the third question, the author considers that delivery ordinarily takes place in about 280 days from the commencement of the menstruation immediately preceding conception, and that a fœtus born before the beginning of the thirty-first week, or less than 210 days after conception, is not viable. The new project of law in Sweden, however, fixes on 180 days as the shortest period at which a viable child can be born, and states expressly that a husband who has been absent during the first 120 days of the 300, immediately preceding the birth, may repudiate the child; this law nearly agrees in principle with the old proposition of Hippocrates and Galen,—that the 182nd or 184th day was the earliest a child could be born with hope of a possibility of preserving its life, and also coincides with our experience, for we have known instances, and cases are on record, of children having been born viable at the commencement of the seventh month. The French law fixes six months, or 180 days, as the term of legal viability.

The author believes it to be undeniable that delivery may take place so late as the 320th day after the beginning of the last menstruation, which may, according to Osiander, be occasioned by want of tone in the uterus, produced either by mental causes, as grief, disappointment, terror, and the hysteric affections consequent thereon; or by physical causes, as losses of blood, long-continued suckling during pregnancy, large abscesses, deficient nourishment, loss of sleep, over-exertion, &c.; or lastly, by mechanical causes, as great dilatation of the uterus from twins or triplets, shortly before the last pregnancy, or from an excessive quantity of liquor amnii [during a previous pregnancy], after the discharge of which a flaccid condition of the uterus may sometimes occur; to which Jörg adds inflammation or induration of the cervix uteri, and in general everything which may impede its dilatation, or cause narrowness of the passages. The new project of law defines the duration of pregnancy to be 300 days. A royal decree, dated 13th May, 1829, declared a child born of a widow 320 days after her husband's death to be illegitimate. Here, however, the 320 days were calculated from the latest period at which lawful conception could

have taken place; when they are reckoned from the commencement of the last menstruation, pregnancy may actually commence two or three weeks later. Many of the causes above mentioned are, however, more likely to produce premature labour than to protract the period of gestation, and whenever labour is postponed beyond the usual period of 280 days, it may be generally attributed to errors in calculation, or to guilt.

The author states that experience has proved that both connexion and conception may take place without the woman's knowledge during the comatose or insensible state produced by syncope, apoplexy, asphyxia, febrile delirium, or the almost wholly unconscious condition which follows epilepsy and many other nervous diseases; but it remains to be proved, that in such a state of disease conception could take place; we agree with him, however, that it may take place during the narcotism caused by intoxication, or by the administration of anæsthetics. Devergie, Nicolai, and others even go so far as to say that they consider it to be not entirely impossible, although it is highly improbable, that a woman may be unconsciously impregnated during an exceedingly deep natural sleep!

The author thinks a general answer cannot be given to the fifth question in his series. He considers that in almost every instance only a probable inference can be deduced from a careful examination of the facts of the particular case.

The sixth question he subdivides, pointing out the principal phenomena which mark the following periods after delivery, by a consideration of which an opinion may be formed as to the time when a birth has taken place:—1. During the first forty-eight hours, or until the commencement of the milk fever. 2. From the termination of the first period to the end of the third or fourth day after delivery. This period is characterized by the existence of the so-called milk fever. This latter is, however, although in some instances very considerable, in others wholly absent. 3. From the termination of the second period to the close of the eighth or tenth day, comprising the time of the discharge of the lochia. The author in a note states that he has sometimes seen the lochia continue until the nineteenth or twenty-fourth day after delivery, or even longer; but in the text he assigns from four to six days as the normal duration of this discharge. Either he underrates it, or it continues a much shorter time in Sweden than in this country, where it *usually* lasts for a much longer period. 4. From the cessation of the lochia to the restoration of the sexual organs in general to their normal condition. We shall not follow the author in his description of the several phenomena characterizing each of the

above-mentioned periods: we may, however, observe, that in speaking of the colostrum he entirely overlooks the remarkable property it possesses of being coagulated by heat alone without the intervention of acid, which so strikingly distinguishes it from the subsequent lacteal secretion[a].

The phenomena which are said to constitute the proofs of a delivery having taken place at a more distant period than from ten to fourteen days are of two kinds, viz. either the consequences of pregnancy or of delivery itself. Of the latter class the most remarkable are:—1st. Deficiency, injury, or cicatrices of the hymen or perineum. 2nd. The remarkable phenomena usually presented by the portion of the uterus projecting into the vagina, and by the os uteri, in women who have given birth to children at the full time, which the author designates the maternal form or condition, in opposition to the virgin form, described in a previous part of his work.

"This portion of the uterus," he observes, "is ordinarily more yielding or softer than in the virgin state, and has no longer its conical form, but is shorter and flatter, has generally a greater circumference at the base, and now consists, as it were, of two tolerably thick, swollen lips; an anterior lip, generally somewhat longer and thicker; and a posterior one, usually shorter and thinner. It is covered with a mucous membrane, which is often tolerably smooth, but is sometimes relaxed and almost wrinkled, and is occasionally (nearly without exception in those who still give suck) excoriated or superficially ulcerated, particularly on the anterior lip (which likewise, when the woman is in the upright position, reaches lower down in the pelvis than the posterior one); more rarely this excoriation or superficial ulceration is found on both lips. In some few cases, in women who have borne children during from sixteen to twenty-five years, I have found nearly the entire surface of the mucous membrane to resemble a puckered cicatrix; the os uteri now generally forms a transverse chink from three to six or eight, and even sometimes ten or twelve, lines broad, which divides the vaginal portion of the uterus into the two lips just now described, and proceeds from side to side over a greater or less portion of its entire width, either in a straight or in a somewhat curved or almost wave-like line. Often, too, from this transverse chink one or more smaller similar slits proceed, which are sometimes so considerable as to divide the vaginal portion of the uterus into three or more lobes, whose edges, usually rounded, are most frequently in tolerably close apposition. This maternal form, which is quite different from the virginal (the latter ordinarily resembling an eyelet, or a section of a fine goose-quill, the edges being perfectly smooth and rounded, and having frequently a whitish or

[a] See Mr. Moore's Paper on the Coagulability of Human Milk, in the seventh volume of our present Series, pp. 290, 492.

colourless viscid mucus hanging out of them), depends on the greater or less degree of rupture which almost invariably occurs in every birth taking place at or near the full term. Similar effects could certainly be produced by the passage of any great and solid mass which might have been contained in the uterus, and perhaps even sometimes by an unusually great ulceration of the os uteri itself; but in the few cases of the latter kind which I have had an opportunity of observing, the entire mucous membrane around the uneven cicatrix has either presented a wrinkled appearance (almost as in some women who have had many children, while the lineæ albicantes on the abdomen and breasts, and other signs of such previous deliveries were absent), or has looked so exceedingly tense, probably in consequence of the contraction of the cicatrix, that it seemed easy to distinguish between its state and the phenomena which remain as consequences of a previous delivery. Still, it is possible that delivery may have taken place even at the full term, without leaving any very perceptible marks on the border of the os uteri, and although the condition and appearance of the vaginal portion of the uterus and of the os uteri constitute one of the most important signs of a delivery having taken place at some distance of time, they never can be, *by themselves*, looked upon as completely satisfactory either as positive or negative evidence; but, on the other hand, they will in most cases, when weighed in connexion with other circumstances, enable us to infer with probability, and almost with certainty, whether delivery has taken place or not."

The only sign, the author adds, which, *taken singly*, can be considered positive evidence of the actual occurrence of delivery, is to find the placenta still remaining in the uterus, with more or less of the funis attached; but it is evidently only in rare instances that this will happen. The conclusive nature of this evidence is so manifest that it was scarcely worth mentioning.

In the determination of the question—at what time a delivery has taken place,—an examination of the child should, whenever practicable, be made. To assist in this investigation, the author gives a table, after Briand, of the changes presented by the child at seven different periods during the first forty days of life. An objection would, however, lie against this table,—that in a disputed case, in which alone the table would be referred to, we never can be certain that the child was not born before the full period of pregnancy.

The author, who throughout his work exhibits great caution in drawing his conclusions, warns the medical jurist against hesitating in doubtful cases to acknowledge his inability to give a definite answer to the questions proposed to him, and against being induced by false shame to endeavour under such circum-

stances to give a semblance of certainty to his testimony. In this we need scarcely say we most fully agree.

The last question he considers is—whether a woman may, without being aware of it, give birth to a child; or whether she may, in consequence of delivery, be reduced to such a state of unconsciousness as to be unable to take due care of her offspring. On the first part of this question the author observes:

"That a woman should during deep natural sleep be delivered of a child at the full time is indeed not altogether inconceivable, but is highly improbable: when the child is more or less premature such an occurrence might be more possible. The first pangs of labour, the discharge from the vagina, &c., might indeed commence during sleep, but it is not likely that the entire process should take place in a woman sound in body and mind without her perceiving it."

It is not credible that a woman could carry a child to the full period of pregnancy and be delivered without her knowledge, but every one is aware that women are frequently delivered in a state of insensibility, arising either from disease or from intoxication, or from the inhalation of chloroform. The second part of the question,—whether a woman may, in consequence of delivery, be reduced to such a state of unconsciousness as to be unable to take due care of her offspring,—has been completely set at rest and answered in the affirmative by the pamphlet of Dr. William Hunter on Infanticide.

The sketch we have just given will be sufficient to exhibit the arrangement of Dr. Wistrand's volume. In its composition he has shown that he possesses the desirable art of condensing his subject matter without impairing the fluency of his style; while the quantity of information it contains in less than one hundred pages will render it a valuable book of reference to those acquainted with the Swedish language, who may be called on to decide "medico-legal questions connected with pregnancy and delivery."

Observations in Surgery. By Benjamin Travers, Jun., F.R.C.S. London: Longman, 1852. 8vo, pp. 230.

The dedication of this work is justly couched in terms of high praise to a parent who has indeed "laboured long and successfully for the advancement of our noble art;" and we consider that the author has hence been placed in most favourable circumstances for presenting to the profession the "first fruits of his experience." Much, however, is not to be expected on the

present occasion, as he prefaces his work by stating, "that there is no attempt at originality,—that the contents are merely a reproduction of what may have been better told already."

The subjects treated of are, many of them, highly important, but some under discussion might, perhaps, have been as well omitted, in consequence of the cursory notice they receive. On all, a great deal of what we cannot avoid terming "puerile" remarks are made; but as the object of the author has special reference to details of management, we will not be too stringent while we take a passing glance at some of his remarks.

Under the head of "Observations on Fractures of the Shaft Bones" are embraced the several forms of those fractures, their complications, and their local and constitutional treatment, whether they are simple or compound. We agree with Mr. Travers, "that whoever may inspect the series of broken bones to be found on the shelves of our Museums will presently satisfy himself of the great variety of fractures, both as to direction and extent." The author alludes merely to the "impacted fracture," yet, meet it when we may, it is not the least interesting form; and we think that he might have somewhat extended his remarks regarding its occurrence in connexion with the "shaft bones." During his educational visit to our city, now many years ago, he had opportunities of inspecting this class of fractures on the shelves of its several museums; and if we mistake not very much, as regards impacted "fractures of the neck of the femur, both extra and intracapsular," he had the opportunity not alone of reading the valuable paper of the late Professor Colles on this subject, but of becoming personally acquainted with his more matured views subsequent to such publication; and surely, Mr. Travers must be also cognisant of the inimitable and truly practical observations of Mr. Robert Adams on them. We think he should have made some allusion to them, and we would recommend him to consult them afresh, as his remarks respecting the non-union, or otherwise, of fractured neck of the thigh bone, *without any* "parietal deposit," must undergo proportionate modification as regards this special form of fracture, even should it be *intracapsular*. We have seen the "impacted" fracture in the tibia, where there was much deformity produced by the projection of the upper end of the lower fragment, and where no accurate adaptation could be effected; and we have very lately seen a case in which this abnormal condition was most characteristic, and yet a more perfect limb, for all ordinary purposes, need not be, although the integuments were actually stretched over the projecting end of bone. Nature is most accommodating under such circum-

stances, when the surgeon may be less blameless; and where he is culpable, how often does she not save him. While on this subject we might allude to the theory of Voillemier respecting impaction in "Colles' fracture of the radius," but we prefer, on the present occasion, to refer our author to the third chapter of Professor Smith's work.

Mr. Travers says:—

"The transverse fracture is of two kinds. The injury may be simple, and in such a case concerns the bone alone, the periosteum remaining unbroken. Such are certain instances of broken rib, clavicle, and tibia in the young; but in later life, the bones being more solid, are not thus simply cracked, or broken through within the investing membrane. Here the periosteum also gives way, of which the consequent displacement is a proof. The transverse fracture is ordinarily marked in the shaft bones by slight effusion; it is not so painful as the other forms, the shortening is less, and the injury has sometimes altogether escaped detection. I have seen repeated instances of this in the clavicle, tibia, and radius, and in the vicinity of a large joint."

Besides the tibia, clavicle, and radius, we have met the ulna broken, transversely and singly, in not a few cases. Perhaps when these fractures occur without breach of periosteum, we might call them cracks or fissures, and not fractures. We certainly have no satisfactory crepitus at first, and generally there is no displacement of moment, so that the less we disturb and examine them the better, as we may readily add to the mischief. The best plan is to state that the bone is cracked: cracked or not, however, the reparation of the injury must take a certain time, and for that time the limb is a maimed one, and the more it is kept at rest, and secured so by suitable appliances, the better.

The remarks on "oblique fractures" are deserving of attention, but they must be familiar to all practical surgeons; and we must admit that "no attentive surgeon will ever accept any rule or method of practice as being without exception at all times." He may find the swing-box, or tray, so as completely to suspend the parts, on particular occasions, and above all, in this form of fracture, very useful; and even when union has been uneven, much benefit may be derived therefrom for its subsequent modification.

When speaking of "comminuted fractures," our author says, that "the process of repair is here necessarily slower than after injury of a more simple nature. A large production of bony matter is requisite, and the progress of ossific union is not always uniform. It may be far advanced in one situation, whilst,

at no distant point, it has scarcely commenced." Such is the fact. We limit our remarks, however, to shaft bones, and so should our author; he ought not to introduce others unnecessarily, such as the "cranium," "scapulæ," and "wings of the ilia." The cases are not at all parallel. However, we think that the reparative process must be slower, particularly where the periosteum is torn in the "comminuted fractures," and where the fragments are floating; and we question the fact, without doubting the veracity of those who assert, that adults who have suffered from such fractures *walk out of hospital in six weeks*, with unimpaired movements of the lower limbs. We live, however, in strange times, and perhaps railroad strides may yet be made in natural reparative processes which we are in the habit of considering as necessarily restricted by established laws. Such statements must be received with great caution. We have, indeed, allowed ourselves to be led away by them, and serious mischief has consequently been the result. We are convinced, that no matter how we may deal with fractures of the upper extremities, the surgeon cannot be too cautious in his directions respecting the "getting up" of the patient who had a comminuted fracture of the bones of the leg, or even an oblique fracture in its lower third; no matter how clever he may be, the patient cannot walk with *unimpaired* movements of the limb at the end of six weeks.

We cannot altogether subscribe to the assertion that, "in the extremities few badly comminuted bones escape the *ultima ratio* of surgery,—amputation." On the contrary, both in the upper and lower extremities we have witnessed most excellent recoveries under the most unpromising aspects of such fractures. We have treated such when the leg was injected with blood to absolute tension, and when, from direct injury, the tibia was in floating, shattered fragments, the skin almost bursting under the eye,—yet all subsiding,— not a trace of suppuration,—and a very fair limb the result. In the extensive field of observation which our author enjoyed we find no allusion made to a sequela of this form of fracture, which we do not pretend to say is peculiar to it, but which we have more frequently seen attendant upon it than on any other, especially where there is much extravasation of blood accompanying the injury. It is what we would call an insidious form of chronic phlebitis. The limb much resembles that of phlegmasia dolens in the parturient female, or a similar affection in man, supervening on an epidemic fever. The surface of the skin is, perhaps, less white, but the solid œdema, and the great enlargement, are the same. It is not attended with a trace of fever, and no pain is present,

the complaint of the patient being weight and tension. It yields to tonic diuretic treatment, and to local mercurials, friction, and bandaging.

Referring to Mr. Travers' observations, we must remark, that as to "split bones," in the proper acceptation of the term, they are very rare. Those oblique fractures, occurring so often in joints, particularly in elbow-joints, should not be classed under this head; they are a variety of oblique fractures. We even question the propriety of the extension of the term to those complicated cases, usually the product of great violence, where the split or fissure is merely superadded to other fractures. Many opportunities do not offer of deciding the question of union of the true "split bone;" but that split condyles unite, and often too rapidly, to the annoyance and disgrace of the surgeon, must be admitted. Who will doubt it in the elbow-joint?

We will make merely one remark as regards the author's case of amputation in compound fracture of the thigh, when death from hemorrhage took place, and when the loss of blood, under the peculiar circumstances of the case, was *nearly a pint.* There are no cases in which more precautions against the loss of blood should be taken than in these, and the operation should not be attempted until every provision against its occurrence has been made. Here was an amputation in the upper third of the thigh, where, from the nature of the injury, much blood must have been previously lost, and where the demand on the system for additional reparative action was called for, quite apart from the amputated limb, and yet *nearly one pint* of blood was allowed to escape *with great rapidity.* Even higher up in the thigh it should not have been permitted. We have witnessed such amputations of limbs, and we never saw this result. If death occurred, it was not from hemorrhage.

We must pass over "Injuries of the Head," disposed as we may be to comment on the text; we, however, recommend a careful perusal of the remarks on the subject, as our author has decidedly had great opportunities of witnessing the different varieties which present themselves, and he gives a tolerably faithful account of the symptoms attendant on them.

Mr. Travers' observations upon "Puncture of the Bladder," and upon those urinary diseases and their treatment, which he particularly notices, will next engage our attention.

The remarks upon "Puncture of the Bladder" bear the date of March, 1849, constituting a paper read at that period before the Westminster Medical Society. This is an operation very rarely performed in Dublin, and, we may add, in Ireland, and

yet the most complicated urinary cases are constantly under treatment. We are by no means satisfied that the operation would have been requisite in the cases given by the author, if we closely analyze the details of symptoms and the previous treatment adopted, which was certainly not followed up as we are accustomed to witness. The "free division of the raphe perinei," in the first case given by our author, was, to say the least, imprudent, where it would appear "an impervious stricture" was *deeper* in the urethra, or perhaps we should say, nearer the bladder,—unless care was taken to avoid wounding the bulb, the occurrence of which was, more than probably, the source of the fatal hemorrhage, though prolonged disease in such cases produces abnormal vascularity in its seat sufficient to produce such. A case of suprapubic puncture of the bladder, which fell under our observation, occurred under the following circumstances:—The subject, a large, athletic man, laboured under retention of urine from impassable stricture. The penis was in a state of engorgement, owing to the forcing and straining attendant on the exertions to micturate. No instrument could be introduced; perineal section was had recourse to, and that not in the mesial line; the hemorrhage was most profuse, and could not be stayed at the moment. The man was writhing in agony; the bladder distended to an enormous amount above the pubis, and there was no time for delay. Here the surgeon promptly tapped the bladder above the pubis: the relief was instantaneous, and the ultimate result of the case satisfactory in every respect. This was the plan which we think should have been adopted in the first case described by our author. Again, in the second case, we are much disposed to think that when an instrument, "a straight sound," was pushed into the bladder some days before, which subdued the incessant desire to make water, and particularly when the crisis, as it is termed, "supervened upon a state of dribbling or stillicidium which had endured for some days," we repeat that, in our opinion,—the result of no small amount of experience in similar cases,—assuming that even the "*sound*" was left in the bladder for some hours, or longer, if the patient could have borne it, and if the urine trickled along its surface, a gum-elastic catheter might have been, as it were, stolen into the bladder on the rapid withdrawal of the sound, and a great deal of suffering and misery saved the unfortunate patient. We speak not theoretically, we speak from facts; we have seen all preparations made for tapping the bladder above the pubis, and previously, as a "*dernier ressort*," a conical silver catheter was viced within a tight stricture in the membranous portion of the

urethra; some urine dropped through it, the catheter was secured (though not fairly in the bladder) in the position it occupied; in eighteen hours it became blocked up, and fresh vesical paroxysms set in; they could not be borne; the catheter was slowly withdrawn, a gum-elastic one was ready to follow its track, and we succeeded in introducing it. The patient, being thus saved from a serious operation, made a recovery far more rapid and far more perfect than could otherwise have occurred. We believe that similar treatment might have been applicable to the case of our author to which we allude. We do not mean, however, to deny the occasional necessity for such operations in impassable stricture,—we have, indeed, performed the operation ourselves, and with success, under peculiar circumstances. This subject is one of vast moment, and we are aware that it, as well as stricture and its treatment, lithotomy and lithotrity, occupy, just now, merited attention, and we hope that some benefit may arise therefrom.

We strongly recommend the perusal of our author's remarks prefatory to the treatment of stricture. We are satisfied that many a urethra is tortured which should never be interfered with, and we regret that such appears to be the fashion of the day. It is the case, we apprehend, in this country, as in England, and notwithstanding the host of "stricture authors" of late, we have not much to congratulate ourselves on as regards the essential practical benefit arising from their labours. The efficient treatment of stricture, based on scientific grounds, is yet a desideratum.

"During a lengthened residence in St. Thomas' Hospital," says Mr. Travers, "a week seldom elapsed without my being called upon to deal with one or more cases of stricture *in its worst form.* I never employed or counselled the use of anything but a silver catheter on those occasions; and there are many rising members of the profession who can bear witness alike to the truth of this assertion, and the success which attended the practice."

This is a bold assertion, and bolder practice, for "*stricture in its worst form.*" All we will say is, that it does not agree with the practice of the Dublin School, and we believe that we are not more unsuccessful than our neighbours. In the true unequivocal *organic stricture* we agree with our author, that "the disease may be rendered comparatively harmless by treatment, but it is never *cured.*" This is the fact. No doubt, its symptoms are greatly relieved—indeed *apparently* cured—if we make no inquiries respecting them, and it is positively most unaccountable how tolerant people labouring under aggravated strictures

become, when even partially relieved of the presence of most disagreeable symptoms, when the healthy state of organs is considered. A patient will assert he is much better, and most comfortable, from the treatment adopted by the surgeon, and yet that patient will probably pass water eight or ten times per day, and perhaps as often at night. Not suffering pain, he becomes reconciled, and no longer considers he is a sufferer. Has the surgeon a right to boast of cure here?

The remarks on lithotrity and on lithotomy tempt us so much that we cannot avoid noticing them shortly. Our opinion respecting lithotrity, from experience as well as from observation, is most favourable to its adoption in very many cases of stone in the bladder, provided a proper selection of the case is made, and, above all, a proper preliminary training enforced by the surgeon. The author alludes to two cases which terminated fatally "within a fortnight after the operation;" and in more than one case he witnessed extreme suffering from the passage of the detritus. We venture to assert that such contingencies were attributable either to careless training before the operation, or imprudent subsequent repetitions of it, and the peculiarities of the case he gives tends to confirm our opinion. In an old man "Weiss' instrument" was introduced after a *copious* injection of the bladder—a *bladder*, too, eighteen months worried by calculus—and a stone was easily gripped, and *repeatedly* broken. Within forty-eight hours this old man was attacked with a smart rigor, and on Monday (the next day) it recurred, and was followed by copious vomiting. Death took place on the fifteenth day from the operation, and our author attributes the fatal result to it.

In our opinion the operation was blameless. The operator was to blame. And if there were four stones, and each as large only as a small pebble, we are much inclined to think that if the urethra was fully dilated, and that there was no enlargement of the prostate—the absence or presence of which enlargement is not even noted by Mr. Travers—this old man might have passed those pebbles, without any operation, in a prepared gush of urine, or one of them might have popped into Heuerteloup's catheter, and so have escaped. We have notes of cases, and have in our possession calculi,—alternating calculi, moreover,—the diameters of which are not less than a quarter of an inch, and one of which passed singly; others, to the amount of three, four, and even five, "*en masse*," of variable size, in one great effort to discharge urine intentionally accumulated in the bladder.

Lithotrity, even in its most restricted form, is an operation

which should be very carefully performed, if performed at all, on old people. We unfortunately learn too often its *fatal* results. Cases, then, for the operation of lithotrity are not to be taken without selection, neither is the operation to be performed at random.

We are inclined to find fault with the author for the very unscientific style in which he describes his other cases of lithotrity. The details are too loosely given; and surely we should learn something more of the nature of a detritus than that it was hard, and that it resembled "fine gravel picked from a garden walk." He says: "My conviction is, that the complete removal or passing off of all the detritus is a rare, or it is a most happy, accident." This may be the case in London, but we have much gratification in being able to state that in Dublin most favourable results have ensued in the majority of cases amongst the comparatively few which have been lithotritized; and we only know of one case, and that a forced one, in which death could be attributed to the operation. In the cases we have alluded to, the most aggravated sufferings have been removed, the bladder has recovered its natural functions, the urine, in all particulars, has regained its healthy condition, and active habits are resumed, and this in patients varying from the ages of 19 to 60 or 70. This moment we have under observation a most promising case in a gentleman not less than 60, where the stone, too, is very hard, so hard as, when being crushed by the lithotrite, to catch the ear of the patient, although placed under the influence of chloroform,—the use of which valuable agent is not even mentioned by our author in either lithotrity or lithotomy.

With a few remarks on the cases of lithotomy given by our author, we must conclude. We shall here quote his own words:—

"I shall now mention two cases of cutting for the stone in infancy[a] where no calculus appeared after introducing the forceps in the ordinary manner. I was present when the late Mr. Tyrrell, a most able surgeon, operated upon a little boy under the following circumstances:—Master B. was first seen by a professional man in 1836. He was a delicate child, rapidly wasting in flesh, and daily losing strength and appetite under the ordinary symptoms of stone

[a] If these two cases are cases of *stone in infancy*, they are to us almost *unique: no special age is mentioned.* We must say, this is a great oversight unless the term is strictly applied. The earliest period at which we ever witnessed the operation of lithotomy *in childhood* was between one and a half and three years of age. We have heard of a fatal case of stone in an infant not more than six months old, but there was no operation performed.

in the bladder, which were thought to be well marked. He was sounded four times, twice by hospital surgeons. A calculus was declared to exist, having a hard surface, and probably of some size. The operation was performed in November, 1836. It is needless to say that it was dexterously done. No calculus was found, the wound never healed, but all the previous symptoms were relieved at once. The child did not rally, and died hectic in the following February. On examination, it appeared that a process of ulceration had destroyed the anterior part of the bladder entirely. The edges of what remained were firmly adherent to the back of the pubis and margins of the open wound in perineo. This remnant was much thickened, its cavity presenting a series of recesses. There was no trace of healthy mucous membrane left, the surface being uniformly broken and sloughy. The left kidney was three times its proper size, and on section it was found to be converted into a large sac or bag containing pus. The same secretion was found in the ureter, and the cellular substance in the cavity of the pelvis had undergone a similar change. There can be no doubt that this disease commenced in a chronic inflammation of the mucous membrane lining the bladder and urinary passages. Hence arose the peculiar irritation which caused so exact a counterfeit of the symptoms of stone as to lead to the performance of an operation for the relief of the patient. The extensive adhesions and other traces of disorganization observed in the coats of the bladder do not belong to any period antecedent to the date of the operation.

"In 1824 a similar *contre-temps* occurred to Mr. Travers when operating upon a very young child at St. Thomas' Hospital. A smart gush of water followed upon a free section of the parts with the cutting gorget, and on introducing the forceps no stone could be found. But on this occasion the surgeon's accuracy was quickly vindicated, and the mystery explained by the discovery, on searching the wet sand at the foot of the operating-table, of a small, brown, pea-shaped calculus, which had escaped with the fluid contents of the bladder. It so happened that this child's sufferings had been very severe, and the symptoms so decided, that the sister of the ward would not be satisfied with the result of the operation, and thereupon instituted a successful search for the missing stone after the removal of the patient."

Now we recollect two cases almost analogous, with the exception that, in the simulated case of stone, the surgeon could not be induced to operate, so convinced was he that no stone was in the bladder. A boy, about six years old, who had all the ordinary symptoms of stone, amongst which the large development of the penis was not the least prominent, was sent to Dublin from the country to be operated upon. The surgeon under whose special care he was placed sounded him on more than one occasion, when under the influence of chloroform. No stone could be detected, no matter what state of

bladder existed, or what position the child was placed in; the condition of the urine particularly attracted attention, and excited suspicion as to the presence of vesical and renal disease. The operation was declined; the boy died in the country within some weeks afterwards; and on inspection the report was, that the inner wall of the bladder was studded over with numerous tubercular eminences, resembling a similar alteration of structure occasionally to be found in the rectum at the same age. The kidneys were also diseased. Such disease is rare in children; however, we have met with more than one case of the kind where the symptoms of stone were so strongly simulated that the surgeon required great forbearance not to operate.

The second case we witnessed in a boy aged between four and five years. He was cut in the ordinary manner for stone, yet no stone could be found. Surgeons of the first eminence were present, and all agreed as to the perfection of the operation in all its details. One stated that he had operated for lithotomy in private, and to his dismay could not find the stone, though there could not be a question of its presence beforehand. By chance, after much searching, in cleaning a clot of blood from his coat, a small calculus, of the size of a garden pea, was found within it. It was also stated by a foreign surgeon present, that the same accident happened to Chelius, and that when the notion of finding the stone was given up, it appeared in the jaws of the forceps used at the operation, whilst it was being cleaned.

But we must here close this notice of Mr. Travers' work, although we may have canvassed some of his statements with apparent harshness, we have no hesitation in recommending a careful perusal of it, as being, on the whole, replete with much valuable practical matter.

On the Diseases of the Kidney, their Pathology, Diagnosis, and Treatment: with an Introductory Chapter on the Anatomy and Physiology of the Kidney. By George Johnson, M. D., &c. London: Parker and Son. 1852. 8vo, pp. 517.

Notes on Bright's Disease of the Kidney, as observed chiefly in the Clinical Ward of the Jamsetjee Jejeebhoy Hospital at Bombay. By C. Morehead, M. D., Professor of Medicine, Grant Medical College. 8vo, pp. 47. From "Transactions of the Medical and Physical Society of Bombay, No. X."

Since the publication of Dr. Bright's Researches on the Connexion between Albuminous Urine and Renal Disease, no organ

has attracted more attention from medical observers, or been made the subject of more extensive and varied investigations, anatomical, physiological, and micrological, than the kidney. Viewing these united labours as to their general results, we may congratulate science on the very considerable acquisitions which have been made to this department of pathology. With rare exceptions, however, we think it must be admitted that, while the labours of the generality of recent investigators have not been unproductive of valuable results, there has been exhibited by most, if not all, of them a decided tendency to follow up a beaten track, and gather from a field which had been already tolerably well gleaned. Another observation, which has been repeatedly forced on our minds, has reference to the application of the results of these researches to practice. It is not in a carping spirit we venture to remark, that no medical term was ever so much abused as that of "Bright's Disease," or employed with such ill-defined ideas of its real pathological import. Dropsy, albuminous urine, Bright's disease, and an almost necessarily fatal result, became associated, as an inseparable connexion of ideas, in the minds of many practitioners. It was with great interest, therefore, that we witnessed the progress of Dr. Johnson's investigations, particularly those which illustrate the pathology of the more curable renal affections, and we now receive with great pleasure a work embodying in the convenient compass of one volume, not only the results of his own researches, but also a general account of the more important diseases of the kidney.

Dr. Johnson's work commences with an introductory chapter on the anatomy and physiology of the kidney, containing a very well-written and concise summary of our present knowledge of these subjects, a correct understanding of which is quite indispensable to those who wish properly to appreciate the changes in structure and function which are brought about by disease. The various monographs on this subject are accessible to most readers, and as they have already from time to time been noticed in former numbers of our Journal, we shall not at present enter into any details respecting them. We pass therefore at once to the subject of "*Acute Desquamative Nephritis*" (chap. iii., p. 84). The term "desquamative" has been introduced by our author for the purpose of expressing what he considers to be the most remarkable and constant characteristic of this form of renal disease, namely, the shedding or desquamation of the epithelium lining the uriniferous tubes,—a character whereby (according to Dr. Johnson) we are frequently enabled, on microscopic examination of the urine, to

detect the existence of renal disease before any general or local symptoms have attracted the attention of the patient or practitioner. This affection is considered by the author to be more frequent than any other form of renal disease, being associated with all the cases of what are usually called acute inflammatory dropsy, whether consequent on scarlatina, or from what cause soever. In the majority of these cases the attack is announced by rigors, followed by subsequent re-action and the usual phenomena of an inflammatory affection. Vomiting frequently occurs at an early period; an unusual puffiness and paleness of the face indicate the approach of dropsy, which rapidly supervenes and spreads to the body and limbs, and occasionally invades one or more of the serous cavities. The urine is scanty, sometimes altogether suppressed; its colour varies from a slight smoky tinge to a deep blood-red; and it is usually so abundant in albumen that it becomes nearly solid on boiling, or by the addition of nitric acid. The specific gravity is from 1020° to 1025°, or even higher; but a comparison of the specific gravity with the quantity will show that the amount of solids excreted is smaller than the usual average[a].

Pain and tenderness in the loins, frequent desire to pass water with scalding during micturition, tenderness in the epigastrium with flatulent distention of the stomach and frequent nausea and vomiting, are symptoms of usual occurrence, but will be found varied in degree, intensity, and mode of combination in different cases. If the urine be now examined with the microscope, it is found to contain coagulated fibrin, blood corpuscles, cells having for the most part the characters of renal epithelium, and occasionally crystals of uric acid. Some of the fibrin is coagulated in masses, having no definite form; but with these masses will be found—

"Numerous cylindrical bodies, composed of fibrin, which, having exuded from the Malpighian bodies, has coagulated in the tubes; and, escaping thence, presents solid cylindrical moulds of the interior of the tubes, in which are entangled blood corpuscles and epithelial cells, which have been shed by a process of desquamation from the surface of the tubes. To the casts thus characterized by the presence of recently formed and entire epithelial cells, I propose

[a] The very useful table compiled by Dr. Golding Bird should be familiar to every student and practitioner: it shows at a glance the weight of a fluid ounce of urine, and the quantity of solids to the ounce in grains. The curious coincidence between the number of grains in the ounce and the last two figures (on the right hand) of the number expressing the specific gravity, forms a very ready means for estimating the total quantity of solids, which is found by multiplying the number of ounces by the figures just named. The average quantity, it should be remembered, is 650 grains in the twenty-four hours.

to give the name of *epithelial casts.* Their average diameter is about 1-700th of an inch."

A wood-cut illustration accompanies this description, which must be inspected in order to form a just idea of the epithelial casts. Blood corpuscles, cells, and pus corpuscles are also to be found in the field of the microscope. Three varieties of casts, differing from that just described, are to be met with:—First, casts composed entirely of blood; second, casts of larger size, about 1-500th of an inch in diameter, of a wax-like appearance; and third, casts about half the diameter of those last mentioned. Each or all of these varieties may be associated with the epithelial casts: they have a special significance, which is subsequently considered. Another modification of the casts and epithelial cells deserves particular notice,—it is where oil globules are observed in their interior, the quantity of which may vary considerably. Though at an early period of his researches Dr. Johnson was led to consider the presence of oil an extremely unfavourable occurrence, subsequent experience has shown him that the prognosis is not necessarily bad in all cases. The following observations on this subject deserve attention:—

"The result of my observations with reference to this matter is, that in children oil very rarely appears, either in the cells or in the casts, during an attack of acute desquamative disease; in adults, on the contrary, very frequently more or less oil may be seen, as already mentioned, when the disease has continued beyond a period of two or three weeks. So long, however, as the oily casts and cells are few, in comparison with the epithelial casts, and the scattered epithelium free from oil, there need be no apprehension of an unfavourable result; but if, on the contrary, while the urine continues highly albuminous, the epithelial casts and cells diminish in proportion to those which contain oil, until at length nearly all the casts have more or fewer oil globules on the surface, and the greater number of cells are more or less distended with oil,—under these circumstances, there will be much reason to fear that the kidney is passing into a state of fatty degeneration,—a transition not less serious in its nature and consequences than that from acute pneumonia or bronchitis to a tubercular deposit in the lung."

The careful daily microscopic examination of the urine becomes, therefore, indispensably necessary in the management of these cases, as by this means alone can we at all correctly estimate the actual condition and progress of the disease committed to our care. In no other way can we establish an accurate diagnosis, or get early intimation of the insidious advances of a disease which, to the physician uneducated in micrology, only declares itself by phenomena which result from profound and

irremediable structural changes. The appearance of oil in the cells or casts should always make the practitioner exceedingly guarded in giving a prognosis; when, however, it occurs in connexion with acute desquamative nephritis, Dr. Johnson's experience leads him to conclude that, in the majority of cases, we may anticipate that the oil will gradually diminish in quantity, the urine again assuming its normal composition. Amongst the appearances to be most frequently found associated with those already mentioned, is the deposit, often very copious, of uric acid; in our author's experience, it was found to occur usually after the first congestion of the kidneys had been relieved, and when the urine was becoming more abundant. This deposit frequently continues until the patient is quite restored to health; its occurrence in acute desquamative nephritis forms a marked point of distinction between this disease and fatty degeneration of the kidney, which is rarely accompanied by an abundant sediment of any kind.

The morbid appearances to be observed in fatal cases are, in the first place, increase of weight: each kidney may be found to weigh from five to eight ounces, or even more. Dr. Johnson estimates the normal average weight of the kidney at four and a half ounces in the male, and somewhat less in the female; believing that the higher figure of five and a half for the male, and five for the female, assigned as the average by Dr. Reid and others, results from including amongst healthy kidneys specimens which presented to the naked eye no trace of disease, but yet would be found, on microscopic examination, to have the tubes crowded with epithelial cells, the result of desquamative disease, and which would materially increase the weight of the organ. Besides increase of weight, there is also increased vascularity, irregularly distributed; some portions of the surface being quite pale, while others are of a bright scarlet colour,—the vessels much gorged with blood. Sanguineous spots, round or irregular, are to be observed; these, as pointed out by Mr. Bowman, are not enlarged Malpighian bodies, but convoluted tubes filled with blood.

On microscopic examination, it is seen—

"That the disease affects chiefly the cortical portion of the gland, and that the morbid deposits are mostly limited to the interior of the convoluted tubes. Most of these tubes are found to be unnaturally opaque, in consequence of being filled with epithelial cells, which have been formed within them, and thrown into their cavity. The tubes are crowded with these cells in different degrees: some being fully distended, while in others there is little evidence of the desquamative process having occurred, there being only a single layer of

epithelium on their walls, and this either differing little from the normal appearance, or perhaps being unnaturally opaque or granular in texture. The most crowded tubes will usually be found in those parts which to the naked eye appear pale and anemic. Some tubes appear to be rendered more opaque by the effusion of the coagulable constituents of the blood amongst the epithelial cells; in which case the addition of acetic acid clears the tissues and facilitates their definition; so that a tube, which had previously presented only a confused, granular, and opaque appearance, may be seen to be filled with epithelial cells which have been shed into its cavity." . . . . "Frequently in the examination of the tubes, a portion of their contents being squeezed out, presents exactly the appearance of the *epithelial casts* which have been described as existing in the urine."

Even in the healthy kidney a small quantity of oil may often be seen in the epithelium of some of the tubes; and in desquamative disease the presence of oil globules in minute quantities may, as already indicated, be looked for. The remainder of this section, as also that devoted to the pathology of the disease, deserves attentive perusal. Under the last head we find the following proposition introduced, and we notice it at present, not that we fully coincide in it, nor for the purpose of entering on any detailed discussion of its merits, but in order to give our readers the author's opinion on this important point:—

"*All the changes of structure commence in the secreting cells of the gland, and are the result of an effort made by the cells to eliminate from the blood some abnormal products, some materials which do not naturally enter into the composition of the renal secretion.*"

We are disposed to consider this proposition, as it stands, rather too absolute, assigning, as it does, to general or systemic causes the origin of all renal lesions. But this is not the only place in which this doctrine is propounded in a very positive manner; thus we find, at p. 109:—"*All the causes of renal disease have this common feature, that they tend to produce a morbid condition of the blood.*" We have, on more than one occasion recently, given our adhesion to the system of *rational humoralism* which begins to prevail in most of the schools of Europe; but we object to such exclusive adoption of humoral views as are embraced in the foregoing passages. We have room only to say, that the sections on pathology, causation, diagnosis, and prognosis, are well written. We come now to the subject of treatment.

Before entering on the question of treatment, we cannot again too forcibly insist on the necessity of early and accurate diagnosis. In the case of acute desquamative disease, we have

to deal with an affection in all respects amenable to treatment when judiciously applied. Though unquestionably a disease of a serious nature, as remarked by our author, it is one in which we have fair grounds for generally indulging a favourable prognosis. How invaluable, therefore, those means which enable us to distinguish it from that profounder and more formidable lesion which has, in common with it, the phenomena of dropsy and coagulable urine. No case more fully exemplifies the great value of the microscope as an agent of clinical research. No educated physician can hesitate to recognise its claims to a place of equal honour and importance with the stethoscope. The sceptics and the cavillers are to be found only amongst those who are shamefully ignorant of what has been and is being done in a large portion of the field of medical research,—even out of their own mouths they are condemned.

Amongst the first indications for treatment are rest in the horizontal posture, a sparing diet, and the use of simple drinks in small quantities. Free action of the skin and bowels should be induced. The hot-air bath and antimonials will be found most effectual for the first object. In some of Dr. Johnson's cases the use of the warm bath was found to be attended with great distress and difficulty of breathing to patients suffering from dropsy. Mercury, except as an aperient, he does not approve of, even in cases of concurrent serous inflammations. In cases marked by severe pain in the loins, highly albuminous and bloody urine, with tendency to drowsiness or coma, more active measures will be required. Cupping over the loins, to the extent of eight or ten ounces for an adult, and two or three for a child, will often be followed by marked relief. Counter-irritation is also useful:

"*This, however, must not be effected by any of those agents which have a tendency, after being absorbed, to irritate and inflame the kidney. Cantharides and turpentine are to be especially avoided.* Mustard, or liquor ammoniæ, with oil or cerate, or diluted with water and applied by a flannel or lint covered with oil silk, is a safe and efficient counter-irritant."

Vomiting is often a distressing symptom, especially when the urine is scanty. Dr. Johnson advises that it should be encouraged by drinking moderate quantities of warm water, and that no attempt should be made to check it by cold drinks, as we must regard the gastro-intestinal secretions as a means of eliminating some of the poisonous materials which the kidneys fail to excrete, and it would be dangerous to check this process

before another channel is opened for the escape of the retained matter. When convalescence is commencing, the preparations of iron may be employed with great benefit[a]. Some instructive cases will be found in the Appendix to Chap. III. p. 139, *et seq.*

Acute desquamative nephritis, which, as we have seen, is, under favourable circumstances, capable of complete resolution, with restoration of the affected organ to a perfectly normal condition, occasionally passes into the form of "chronic desquamative nephritis;" but this latter disease is not to be regarded necessarily as a secondary result of the acute affection, as it has frequently a distinct pathological origin. The chronic disease "is characterized by a long-continued shedding of epithelium, which appears in the urine in a more or less disintegrated state," the tubes gradually losing their epithelial lining, becoming atrophied, or filled with a new and frequently unorganized material, or lastly, "they continue to be nourished, secrete serum in their cavities, and so become dilated into cysts." We have, in our last Number[b], considered the most recent researches on the subject of cyst formations, and do not, therefore, intend to re-open the question at present. In the chronic form of disease under consideration, Dr. Johnson has observed marked changes in the renal blood-vessels. The usual result with regard to the general appearance of the organ itself is a diminution in size, with firmness of its substance, and irregularity of the surface. The urine is generally albuminous, somewhat more abundant than natural, and its specific gravity proportionately decreased. "The disease is frequently the consequence of gout, chronic rheumatism, or some allied disorder of the general health." Dr. Todd is in the habit of calling it the gouty kidney, but our author thinks this too exclusive a term. This affection is frequently latent:

"I have before stated," says Dr. Johnson, "that chronic nephritis may exist for a long time, and may produce extensive disorganization of the kidneys without the occurrence of any symptom to attract the patient's notice, or to arouse the anxiety of his friends. Many cases terminate without dropsy having occurred at any period. When present, it is generally only slight and transient: a slight puffing about the face, particularly in the eyelids, is most frequently to be observed. It is to the character of the urine we must look for the most constant and least fallacious indications. The signs which

[a] Some valuable observations on the use of chalybeates in cases of dropsy after scarlatina were published by Dr. O'Ferrall, of this city, in the Dublin Hospital Gazette, January 1st, 1846. These researches appear to have been overlooked by subsequent writers.

[b] Page 174.

are least fallacious, and therefore of most value, and which convey the earliest information of the actual existence of renal disease, and which, during all its stages, indicate with the greatest accuracy its nature and progress, are those connected with the state of the urine."

In gouty cases it is chiefly at periods when there is slight inflammation in the joint, or for a short time after the subsidence of these attacks, that we must look for characteristic appearances in the urine; it is requisite to examine this secretion when not turbid with lithates, which obscure all other products. In most instances, therefore, it will be necessary to wait until the gouty paroxysm subsides, when the urine will generally present the following characters:

"In quantity, specific gravity, and colour, it differs very little, if at all, from the standard of health; it is, perhaps, more acid than usual, but contains not a trace of albumen. When passed it is quite clear, and remains so after standing for a few hours; but it deposits a dense, whitish material, which often looks like fine dust at the bottom of the vessel. The quantity of this sediment is variable, but at this stage it is never abundant. On a microscopic examination, it is found to consist partly of a scattered, amorphous, granular material, and partly of the same material in the form of cylinders, which have evidently come from the renal tubes, and for which I propose the name of 'granular casts'. When we examine the kidneys, we shall see that this granular material is evidently disintegrated epithelium, which has become detached from the basement membrane of the tubes, and subsequently washed out with the urine; some of it retaining the cylindrical form, while part is irregularly scattered. Occasionally, too, evidence of the nature of the material is afforded by the fact of the same casts entangling one or more epithelial cells, either entire or only partially disintegrated."

In more advanced stages of the disease it will be found, that during paroxysms of gouty inflammation in the joints, the secretion of urine becomes scanty, and its specific gravity high; albumen will be also detected, and the urine will continue albuminous for a variable period, then gradually cease to be so till the next attack. In more advanced stages of the disease, the urine will become permanently albuminous, the quantity being however, variable, and it even sometimes disappears towards the termination of the disease. Three varieties of deposit may now be met with: first, a rather copious, dense, whitish precipitate, composed of granular casts and scattered particles of epithelium; secondly, a copious sediment similar to that just described, but with casts of a large size, having a peculiar whitish waxy appearance. The third variety is when the urine is colourless and highly albuminous, as in the cases already described, but

the sediment is very scanty, forming only a slight cloud or dust at the bottom of the vessel; it contains the large "waxy casts" in small numbers, and occasionally a few granular casts or disintegrated epithelium, corresponding differences being observed in the kidney.

The chief morbid changes in the kidney which has been the subject of chronic desquamative nephritis will be found in the tubules, the branches of the renal artery, and the Malpighian bodies. The uriniferous tubes become stripped of their epithelium, partly obliterated or filled with the albuminous or fibrous material which constitutes the waxy casts, oil and serum will also be seen amongst their contents, and the latter occasionally collects in cyst-like dilatations of the tubes. The process of denudation of the tubules has not been found complete by Dr. Johnson until the disease had existed for a period of six months. The appearances observed by the author in the blood-vessels indicate, he believes, an impediment to the circulation through the inter-tubular capillaries, and a consequent increase of pressure on the vessels which, in the order of the circulation, lie behind them. The walls of the Malpighian capillaries and the arteries are much thickened, while the remaining vessels are unchanged. In the arteries hypertrophy of both sets of muscular fibres takes place, the coats in some instances being two or three times as thick as natural. "The entire Malpighian body is not sensibly enlarged, but the increased thickness of the capillary walls leads to a close packing and crowding of these vessels, so that their outline cannot be clearly distinguished." We regret we cannot enter into Dr. Johnson's views on the proximate cause of albuminous urine and dropsy; they do not, however, admit of condensation, and deserve perusal in full.

With reference to remedial measures, many of the indications already considered in connexion with the acute form of the disease must be carried out. In the chronic form, however, a generous diet will generally not only be well borne, but will be of material benefit. Dr. Johnson speaks very favourably of the advantages to be derived from sea air, with moderate exercise, especially driving. The skin should be kept warm, the bowels moderately active, and in gouty cases the wine or acetous extract of colchicum may be combined with ordinary aperients. If there be pain in the loins, the abstraction of a small quantity of blood by cupping will be found very serviceable; dry cupping may also be frequently repeated with advantage. Counter-irritation on the loins may be kept up by ammonia, mustard, or tartar emetic; ordinary blisters and tur-

pentine should be avoided for the reasons before assigned. Iron may be employed internally with the same benefit as in convalescence from acute nephritis. Those who are anxious to learn the author's opinions on the treatment of the more difficult or complicated cases, we must refer to the work itself.

Several sections are devoted to "Waxy Degeneration of the Kidney," "Non-desquamative Disease of the Kidney," and the "Granular Fat Kidney." All are enriched by the author's own researches and observations, and will well repay perusal.

Dr. Morehead's Essay will be read with advantage by those who are anxious to make themselves familiar with the nature of this disease in tropical climates: his conclusions are, that it is of as frequent occurrence amongst the hospital-frequenting classes in Bombay as in the large cities of Europe. His paper is illustrated by thirty-one highly instructive cases.

Before concluding we wish to add, that we have in our possession a copy of M. Gluge's Essay, published in the "Archives de Médecine, Belge," 1840, on what was then denominated cirrhosis of the kidney. This distinguished author, to whom micrology is so much indebted, was, we believe, the first who accurately investigated and described the actual histological changes which take place in the granular kidney of Bright, and clearly pointed out its fatty nature. We take the present opportunity of proclaiming this fact, as we have reason to know that its discovery has been claimed by others: subsequent observers have only followed in the track prepared by M. Gluge's zeal and industry.

The Principles of Surgery. By James Miller, Professor of Surgery in the University of Edinburgh, &c. Second Edition. Illustrated by 238 Engravings on Wood. Edinburgh: A. and C. Black. 1850. 8vo, pp. 803.

The Practice of Surgery. By James Miller, F. R. S. E., &c. Second Edition. Illustrated by 227 Engravings on Wood. Edinburgh: A. and C. Black. 1852. 8vo, pp. 687.

Although we cannot altogether approve of the custom adopted by many modern writers of considering separately the principles and the practice of the two great divisions of the healing art, Medicine and Surgery, it is not without its advantages to the student, whose views are chiefly directed to obtain a legal qualification to practise. The matter he has to study is there-

by, to a certain extent, simplified for him, and he is enabled to obtain by reading a certain degree of acquaintance—too often indeed, owing to the defective mode of examination adopted universally by the numerous licensing bodies of our country, sufficient for his purpose—of what can be properly understood or acquired only by clinical investigation and experience. Yet Mr. Miller is perhaps not much to blame for following the example of so many celebrated men who have preceded him, and however he may have erred in issuing his Treatise on Surgery in two volumes, and as two separate books, he has fully redeemed himself by the value of their contents. His works, when originally published, were well received by the profession, and in the second editions of both, which are now on our table, many and great improvements may be seen even at a glance. Not too proud nor too self-opinionated to esteem the labours of others, or to take advantage of the research and experience of surgeons not immediately connected with his own school, he has diligently collected and carefully weighed whatever new may have been added to surgery since his first editions appeared, and both his Principles and Practice, consequently, now present a finished character, and deserve to be placed in the very first rank of the surgical literature of the nineteenth century. Than this we can offer Mr. Miller no higher praise, and to our readers we cannot commend them more warmly.

Dictionnaire des Altérations et Falsifications des Substances Alimentaires, Médicamenteuses et Commerciales avec l'Indication des Moyens de les Reconnaitre. Par M. A. CHEVALLIER. Paris: Béchet Jeune. 1852. Vol. II. 8vo, pp. 580, Pl. 10.

IN a recent Number of our Journal[a] we brought under the notice of our readers the first volume of the Dictionary of M. Chevallier, and as the subject of which it treats has latterly attracted considerable attention, we thought it might not be unacceptable to those who feel an interest in public hygiene if we again referred to the question on the completion of the book. Apart from some faults of style and a too great tendency to enter into elementary minutiæ, it is a valuable compilation, and in most respects superior to the other works which we have reviewed with it, and to all others on the subject with which we are acquainted.

But for the peculiar position which M. Chevallier enjoys in Paris, and the numerous judgments of police magistrates

[a] Vol. x. N. S. p. 175.

which he cites, we would be inclined to consider many of the sophistications which he mentions as chemical recreations intended to frighten old ladies of considerable specific gravity. Who, for instance, could have believed that in this materialist age the doctrine of Berkeley, that matter was an idea, should be so universally held, that a mere effort of the imagination could transform gum tragacanth, yolk of eggs, glue, and sheep's brains into new milk; sloe-leaves into nerve-exciting tea; corn whiskey, cream of tartar, and decoction of Brazil wood, into the juice of the grape; pipe-clay, sulphate of baryta, or levigated bones, into soap! In our younger days the wonderful tale of Aladdin and his lamp excited our imaginative faculties to a considerable degree, and although we have dreamed of castles in the air, and gardens filled with exotic flowers and the most delicious fruits, we never succeeded in tasting them, a fact which proves that the East is no longer the source of imagination,—that the mysteries of an apothecary's or a grocer's shop far exceed those of any disciple of Zoroaster, and that there are far more spirits enchained in those crypts called wine-cellars, ready to assume any condition of body or age, than were ever ruled over by Solomon's ring. If we were in the fairy tale line we would prefer studying Chevallier to those old clumsy sagas, whether Indian or Scandinavian, from which poets have been hitherto deriving materials for the wonderful.

Like the astounding marvels of old, however, we are of opinion that these modern miracles in the art of sophistication are very rare, save and except those of chemists and druggists, who are true alchemists, and that many of the supposed sophisticated articles are the product of ignorance more than of roguery. Sometimes, indeed, it is the result of both, as a curious incident which came under our own observation will serve to illustrate. During the famine in 1847 a chemist in Dublin drew attention to the necessity of providing in the food for the daily waste of the body, and among other substances dwelt upon the importance of bone earth; an observant dealer in bread-stuffs, conscious, we suppose, of the inferior quality of his materials, was struck with the happy idea of conferring a benefit upon his customers and upon himself, by adding to his Indian meal a quantity of powdered bones!

In Ireland, at least, the fraudulent adulteration of food is not carried to any great extent. We have very rarely observed the presence of alum or borax in bread, and in no instance have we known a baker to use sulphate of copper. Our milk is, probably, never adulterated with any more dangerous sub-

stance than water; and, with the exception of those fungi upon wholesome trade, "cheap tea warehouses," there is comparatively little wilful sophistication. Indeed we believe that the cry which has been very recently made in England is somewhat exaggerated, and that the amount of skill which it is supposed is displayed in falsificating various commercial articles is very much overrated. We would rather say that falsification proves the want of skill, as it shows the fraudulent trader is unable to compete with the honest one. We are not of those who believe that men naturally prefer dishonest to honest means when both are presented to them.

But in saying this we are far from affirming that trade is not at present immoral simply because the trader does not sophisticate his goods with foreign ingredients. On the contrary, we firmly believe, that the amount of evil produced by all sophisticators put together, falls very far short of that species of roguery which we may describe as the adulteration of language, to wit, selling damaged and inferior food as superior. Men who would scruple to add a little pipe-clay to flour, or sulphate of baryta to soap, or sell you veritable sloe-leaves for tea, are capable nevertheless of selling a flour which would truly yield the bread *of life* and would afford an admirable study for the entomologist, or of vending a soap made to contain an additional 10 per cent. of water by the proper admixture of cocoa-nut oil, or of roasting their coffee in its own steam in order that it may weigh heavier. The people who do this are usually very pious, and patronize the press in order to extol their wonderful magnanimity in providing the public with articles at a cost far below their value. It is not their articles which are adulterated, but their advertisements. We firmly believe that the public has more to fear from this class than from the real sophisticator. We will suppose the case of an article like ale or porter, which, according to common belief, is adulterated with almost every kind of bitter drug, and which, in the opinion of all genuine teetotalers, is a slow liquid poison. How the Londoners could ever continue to drink such a hell-broth as porter is usually described to be in the works of hypochondriacal chemists and itinerant vendors of cheap philanthropy, is a puzzle to us. What constitutions they must have to be able to swallow, day after day, solutions of strychnia, copperas, opium, &c.! Now the simple truth has come out,—that no such deleterious drugs are employed in the manufacture of either porter or ale; even that most dreaded of all compounds, bitter ale, has been found absolutely free from all such substances as strychnia. For our own part, we cannot conceive

how the opinion could ever have gained ground. We have ourselves drank at different times a great variety of the best known ales and porters, in Great Britain as well as at home, and we must say, that we never felt any of those effects which would inevitably follow the employment of even one of the articles supposed to be fraudulently employed in their manufacture. The idea that an ale like Allsopp's,—a beverage which, though obtained merely from malt, hops, and pure water, may, as prepared by him, be truly classed with any procured from the juice of the grape,—could contain a drug like strychnia, is preposterous! *Successful adulteration is never carried out on a large scale, as it would be at once detected.* There can be no doubt that there is abundance of bad porter and bad ale; but why conjure up such a list of poisons to account for their badness, when it must be apparent to every one that inferior materials, bad management in the manufacture, and impure vessels, would fully account for it?

In thus throwing a doubt upon the extent to which fraudulent sophistication is carried, we do not mean to assert that M. Chevallier's facts are incorrect, or his book useless. What we want to show is, that although all the species of frauds noticed by him have occurred, and no doubt do occur, and that a book which contains a record of these rogueries, and the best means of detecting them, is very useful, nay, indispensable; still the extent to which they are carried is very slight, and there is no necessity for keeping a chemical laboratory to examine our food previously to swallowing it, or to deprive ourselves of an excellent beverage because some person has dreamt, or mayhap found it profitable to imagine, that it contained poison.

There is one deficiency in M. Chevallier's book which deserves to be mentioned: it is this,—that while giving such minute details of every little petty fraud, he has not noticed those nefarious substances which, under some innocuous names, are foisted on the public, such as *Revelenta Arabica*, *Pâte Pectorale*, *Cough Lozenges*, and many others which it would be useless to name, and which may, as the first-mentioned, be the flour of some indigenous plant like the lentil, and sold as the product of some Indian climate at six or seven hundred times its intrinsic value; or, like others, compounds of opium, which in time destroy the constitution, and bring on the misfortune of confirmed opium-eating. A thorough exposure of these absurd humbugs would do more to put down immorality and credulity, and confer more benefit upon public hygiene, than searching the records of police-courts to rake up every peccadillo of some miserable huxter.

PART III.

MEDICAL MISCELLANY.

Electro-Physiological and Pathological Researches on the Individual Action and the Uses of the Muscles moving the Thumb and the other Fingers[a]. Memoir presented to the Academy of Medicine of Paris. By Dr. DUCHENNE (de Boulogne), Laureate of the Institute of France, &c. &c.

THE individual action and the uses of the muscles which move the fingers have been badly defined or utterly unknown. Such is the conclusion I came to long ago, after having observed a great number of pathological facts quite inexplicable by the present anatomical and physiological data. Thus, for example, the extensors of the fingers and the superficial and deep-seated flexors, according to the ideas generally received, are the only muscles known to extend or bend the phalanges of the fingers; nevertheless, I have sometimes seen the two last phalanges extended in cases where the extensors were paralyzed; and sometimes the first phalanges performing the movement of flexion, although both sets of flexors lost their action on the two last phalanges, and consequently on the first. At other times I have noticed, that notwithstanding the extensors and the flexors enjoyed perfect integrity, the extension of the two last phalanges was impossible or very limited, while the first phalanges could but slightly, or not at all, obey voluntary flexion.

These functional disorders were attended with serious deformity of the hand, and even with articular deformation, which arose from the faulty attitude of the phalanges carried into abnormal directions by powers certainly foreign to the action of the extensor and of the flexor muscles. There existed, in these various cases, neither muscular contraction nor primary articular injuries that could in any manner explain these phenomena. With regard to the thumb, pathology equally contradicted physiology.

It is to the observation of these pathological facts I am indebted for the idea of the electro-physiological and pathological researches

[a] [This important memoir has been specially translated from the original, under the superintendence of the author, for our Journal.—ED.]

forming the object of the present memoir, for those facts seemed to show that the extensors and the flexors, both deep and superficial, do not move the three phalanges with equal power, and that, physiologically, certain phalanges do not obey the action of these muscles. Was it not evident also, that other muscles, besides the extensors and flexors just mentioned, must have the greatest share in moving the phalanges, extending the one and flexing the others? Did not the same obscurity prevail with regard to the functions of the thumb?

I conceived that it belonged to localized electricity to endeavour to solve these problems.

We know that localized electricity can limit its power to each muscle,—to each of its fasciculi, while volition but rarely possesses this faculty, and I am not convinced that volition can even at times possess such power, whatever the exercise or the education of movements may be[a].

The results of my electro-physiological researches have gone beyond my expectation. They have shown, and in this Paper my purpose is to prove:—1. That the extensors and the flexors of the fingers do not possess all the properties hitherto attributed to them. 2. That the movements of certain phalanges are found to be foreign to the attributes of these muscles, and that these functions are fortunately devolved on other muscles. 3. That this ingenious distribution of function amongst all the muscles moving the fingers allows the mutual independence between the extensor movement of the first phalanges and that of flexion of the two last phalanges, and *vice versa*, independence quite necessary to the mechanism of the most frequent movements of the fingers, and in the absence of which the hand would lose its lightness and dexterity. 4. That the functions of the abductor longus, and extensor longus et brevis pollicis have been wrongly defined, and that the greater part of the muscles forming the thenar eminence possess an action hitherto misunderstood, and without which the thumb would lose its principal uses.

The facts we arrive at by the means of those electro-physiological studies acquire vast importance when we come to the diagnosis and treatment of the diseases belonging to the muscles which move the fingers and thumb. I have thought proper to lay them under the control of pathology; and with this view I undertook a series of electro-pathological researches. The latter, while they establish the exactness of those new facts, enable us to become better acquainted with the degree of utility of each individual muscle throughout the various uses of the fingers and of the thumb.

Lastly, these electro-pathological researches have allowed me to determine in a precise manner the real influence over the action of the phalanges of the fingers, and on the first metacarpal bone and

[a] [See the paper published by Dr. Duchenne, in the twelfth volume of our present series.—Ed.]

the phalanges of the thumb, of the extensors, the flexors, and the interosseous and lumbrical muscles, in virtue of their tonic contractility; these researches have, moreover, led me to understand the mechanism of certain deformities of the hand consequent on atrophy or loss of tonicity in each of these muscles; such cases having hitherto baffled every kind of explanation.

A. Muscles moving the Fingers.—When, the wrist being flexed, and the fingers also flexed towards the palm of the hand, electrical excitation is directed to the *extensor* muscles of the fingers, there is observed a succession of extensor movements, which take place in the following order:—The two last phalanges are extended on the first, then the latter on the metacarpal bones, which in their turn are extended on the carpus and on the fore-arm. During this movement the last phalanges are kept extended on the first until the metacarpus has reached an almost parallel direction with the fore-arm. But at the very moment, extension still continuing to proceed, the metacarpus forms an angle with the fore-arm, the two last phalanges become flexed on the first, and the more so as the hand is the more thrown back towards the fore-arm. However great at this moment may be the energy of contraction taking place in the extensor muscles, it is impossible to effect the straightening out of the two last phalanges on the first, but the latter are still more thrown back towards the metacarpal bones.

It is evident from this experiment that the action of the extensors on the last phalanges is much limited, and that if these muscles were the sole extensors of the fingers, the latter would assume the form of claws as soon as the wrist became thrown back on the fore-arm. This flexion of the two last phalanges is caused by the tonic resistance of the superficial and deep flexors, which the extensors cannot overcome.

Pathological facts will show that the physiological action of the extensors on the two last phalanges is still less than the electrical contraction of those muscles seems to indicate. It is, therefore, necessary that other muscles should help the impotent extensors in order to complete the extension of the two last phalanges. And electro-physiological experiments will soon allow us to discover what muscles are charged with this important function.

As another result of the preceding experiment we see that the extensor muscles extend in a very powerful manner the first phalanges on the metacarpal bones.

I will show in the following paragraph how fortunately it happens for certain movements of the hand that extension of the first phalanges can be produced independent of extension of the two last.

Artificial contraction of the *flexor sublimis* and of the *flexor profundus* muscles affects the movement of flexion of the two last phalanges in the manner described by all authors; but the flexion they give to the first phalanges is very weak and secondary, because this movement generally takes place at the moment only when these

muscles are already in a shortened state. A few experiments will show the truth of this proposition.

If the electrical action be limited to the flexores digitorum at a moment when the wrist and the two last phalanges are maintained in extension, the first phalanges become flexed on the metacarpal bones with great energy; but if the fingers are left to themselves, the two last phalanges incline inwards, closing in on the first, which in their turn become flexed on the metacarpal bones, but with no great degree of strength. This movement of flexion of the first phalanges is weakened the more, as the wrist is less thrown back on the fore-arm, and it even becomes nearly completely annulled when the wrist reaches its highest degree of flexion.

The following experiment shows how far the extensors are superior to the flexors in their action on the first phalanges. Make the extensors and the flexors contract simultaneously under the influence of a current of equal intensity, and you will see the first phalanges extend on the metacarpal bones, while the two last phalanges will flex on the first.

Should these experiments appear insufficient, the electro-pathological researches I shall hereafter relate will, I trust, complete the demonstration of the proposition,—that the flexors have not sufficient action on the first phalanges to be the antagonists or moderators of the extensors. Where are, therefore, the real flexors of the first phalanges? Such is the question that electro-physiological experiment shall soon decide.

When the flexor profundus is already in a shortened state, just as it begins to contract, the action of this muscle on the last phalanx diminishes considerably, and may even be annulled; for if, the wrist and the fingers being placed in extreme flexion, that muscle be made to contract either artificially or voluntarily, we see the last phalanx scarcely flex, and still more frequently even not flex at all on the second phalanx, which alone is carried into flexion on the first. The same experiment will equally show that flexion of the second phalanx on the first is effected with little energy, and requires great efforts, contraction then becoming painful.

It is, no doubt, with the view of preventing this shortening of the flexors, and in order to place the latter in the most favourable condition of strength, that the extensor muscles of the first phalanges contract synergetically as soon as volition sends a nervous discharge to these flexors of the last phalanges.

The study of the mechanism of voluntary flexion of the two last phalanges shows that during this movement of flexion the first phalanx places itself involuntarily in extension, provided this phalanx happens to be previously flexed on its metacarpal bone. The degree of contraction of the extensors is then in direct proportion with the force producing flexion of the phalanges.

These movements of the phalanges in inverse directions are rendered necessary by most of the uses of the hand. They are ob-

served, for instance, when the fingers direct a pen, a brush, a pencil, &c. I shall revert to the mechanism of these divers movements when I come to speak of the interosseous and lumbrical muscles and of the muscles moving the thumb.

Electrical excitation of each of the *interosseous* muscles of the hand produces, in succession, three movements:—1. With a moderate current the finger is brought into adduction or abduction (according to the special position of the muscle undergoing electrization). 2. With a current of greater intensity, the third and second phalanges are extended on the first. 3. While the latter movement is effected, the first phalanx flexes on the metacarpal bone.

The contraction of the *lumbrical* muscles produces the two latter movements,—viz., extension of the two last phalanges, and flexion of the first.

Out of the four lumbrical muscles the first is the only one effecting abduction of the finger, and this movement even is very limited.

The interosseous muscles, which cause the fingers to bend away from the ulnar side of the hand, produce this movement of abduction in a more effectual manner than the muscles whose action is to make them incline to that side; the interosseous adductor muscles, on the contrary, which produce adduction of the fingers with less energy, extend to a higher degree, and with greater strength, the two last phalanges on the first. Extension of the two last phalanges by the two interosseous muscles of one finger is, therefore, effected on each side in an unequal manner,—that is to say, that the abductor has a less part in that extension than the adductor. Is it with the view of reconstituting an equilibrium of the powers which are necessary to the production of this extensor movement of the fingers, that the lumbrical muscles (those energetic extensors of the two last phalanges, without being abductors) come in to join their action with that of the interosseous abductor muscles?

I have experimentally laid down, in the first paragraph, that the power of the extensor muscles of the fingers is limited to extension of the first phalanges, and is inadequate to overcome the tonic resistance which the flexor muscles oppose to the extension of the two last. To the interosseous and to the lumbrical muscles alone it has been given to overcome that resistance; these small muscles effect extension of those phalanges with such an amount of energy that we are bound to consider them in future as their real extensors, and the extensor muscles rising from the fore-arm as their very feeble accessories. Here is a conclusive experiment, proving the fact in an incontestible manner:—

Having placed the wrist of an individual (and it will be desirable to select for all these experiments an individual whose upper extremity is completely paralyzed) in a forced extension on the fore-arm, and keeping his first phalanges extended on the metacarpus; if then the extensor muscles are electrified to the maximum of intensity, no movement whatever is observed in the two last phalanges;

but if we place the exciters alternately on the points corresponding to the interosseous or lumbrical muscles, each of these muscles is instantly seen to extend the two last phalanges.

It is easy to prove by electrization that the interosseous and lumbrical muscles flex the first phalanges of the fingers with greater energy than the flexors; for the latter have but a weak action in producing this movement. Indeed, pathology alone can give us an idea of the importance of this function belonging nearly exclusively to the interosseous and to the lumbrical muscles, with the view of counterbalancing the tonic power of the extensors, as they tend to throw back the first phalanges on the metacarpal bones.

The interosseous and lumbrical muscles cannot extend the two last phalanges without flexing the first, and *vice versâ*. There must exist an unknown anatomical disposition, and a very ingenious one, to allow these muscles to effect simultaneously two opposite movements with such a great power. It is not by our present anatomical notions this physiological fact can be explained.

I have already remarked, that the manual uses requiring those movements in inverse directions of the first and of the two last phalanges are very numerous, and that they are of the utmost importance to the writer, the draughtsman, the painter, &c. &c. If we observe, for example, the movements performed by the draughtsman when he holds his pencil between his thumb and his two first fingers, we see one movement leading the line antero-posteriorly, and the other drawing it in a contrary direction to the first. I will analyze these two movements, and lay down the mechanism thereof.

1. *Movement leading the line antero-posteriorly.*—The two last phalanges of the fingers which have to lead the pencil are at first extended on the first phalanges, and the latter are flexed at right angles with their metacarpal bones. If, then, the artist wishes to trace the line antero-posteriorly, the two last phalanges of the fore and middle finger become flexed on the first, while the latter extend on the metacarpus.

The maximum extent of this line is, on an average, two inches in adults. It is due, for the greater part, to the movement of extension of the first phalanges, for if we prevent the latter movement by maintaining the first phalanges flexed on the metacarpus, the extent of the line does not exceed from half to three-quarters of an inch.

The movement I have just analyzed is produced by the synergetic contractions of the flexor profundus and the extensor digitorum muscles. If the latter muscle acted, as it has been thought hitherto, on the three phalanges with equal energy, or if the superficial and deep flexors bent the three phalanges with equal power, the synergetic contraction just alluded to, could not take place without having to overcome considerable antagonism: the extensor digitorum could not extend the first phalanx without being opposed to the flexion of the two last, and the flexion of the latter would impede extension of the first.

The foregoing considerations fully demonstrate, that if these

muscles had really possessed the action attributed to them, the use of the hand would have been considerably restrained.

2. *Movement leading the line postero-anteriorly.*—The mechanism of the movement leading the line postero-anteriorly, is contrary to that just described; that is to say, in order to perform this movement the first phalanges, which are extended, become flexed on the metacarpus, and the last phalanges, being flexed, become extended on the first ones. What I said above of the length of the line traced during the preceding movement is perfectly applicable to the movement of which I am now describing the mechanism. The flexor and extensor muscles of the fingers are completely foreign to the movement which leads the line postero-anteriorly; the interosseous and lumbrical muscles perform it.

The following-electro-physiological experiment exhibits the fact incontestibly. The last phalanges of the fingers and thumb holding the pencil, &c., being flexed to the utmost degree, the exciters are alternately placed on the interosseous or on the lumbrical muscles of the index or of the middle finger, and the fingers are seen to propel the pencil irresistibly forward, each phalanx performing the movement I described above. If, in this experiment, the muscles of the thenar eminence are electrified at the same time as the interosseous and lumbrical muscles, the thumb follows exactly the movements of the fingers. If, on the contrary, the pencil being held fast between the fingers, as in the preceding experiment, the extensors alone are excited, or the extensors and the flexors simultaneously, the first phalanges are directed backwards towards the metacarpal bones, while the last become more flexed, and the pencil is let fall from the fingers.

B. Muscles moving the Thumb and Metacarpal Bone.—If, the thumb and the first metacarpal bone being brought into proximity with the second metacarpal bone, contraction is produced in the *abductor pollicis*, we see the first metacarpal bone carried obliquely outwards and anteriorly, while it flexes on the carpus. During these movements of the first metacarpal bone, the phalanges of the thumb are slightly flexed when the muscle has attained its utmost stretch.

If the contraction of the abductor continues, the hand flexes on the fore-arm, and is slightly carried into abduction. Lastly, in whatever position we place the fore-arm or the hand during the contractions of this muscle, supination can never be produced; the hand, on the contrary, has a tendency to place itself in pronation.

If, placing the thumb as in the preceding experiment, the *extensor brevis* muscle is made to contract, the first metacarpal bone is carried directly outwards, while the first phalanx is extended on the first metacarpal bone, and the second phalanx flexed on the first. And if the contraction of the extensor brevis pollicis be continued, the hand follows this movement of abduction of the first metacarpal bone, but it is not carried either into flexion or supination.

The two phalanges of the thumb being flexed, and the first me-

tacarpal bone being carried obliquely outwards and forwards, if the *extensor longus* be made to contract, two simultaneous movements are observed, viz., a movement of extension of the two phalanges on the first metacarpal bone, and an oblique movement inwards and backwards, performed by the two extended phalanges. At the maximum of contraction the extensor longus throws back the first metacarpal bone, and with it the two phalanges, towards the carpus, to such an extent that the first metacarpal bone forms, anteriorly with the latter, a projecting angle, and the last phalanx is found to be on a plane posterior to the metacarpus. In no instance can supination be effected by the contraction of the extensor longus pollicis.

The *flexor longus pollicis* has no real action but on the last phalanx of the thumb. It is only at its maximum of contraction that the first phalanx is brought into flexion; and even then this movement of flexion is extremely limited and effected without force. No movement is detected in the first metacarpal bone, let the contraction of the extensor longus pollicis be ever so energetic.

The electro-physiological experiments I have just laid down show that the muscles, the abductor longus, and the extensor brevis and longus pollicis, determine in the first metacarpal bone, and consequently in the two phalanges of the thumb, important movements, some of which were never described, and others wrongly defined.

Abduction of the thumb really belongs to the extensor brevis pollicis, while the abductor longus pollicis carries the thumb as much forwards as it does outwards. Thus, the extensor longus pollicis not only extends the two phalanges on the first metacarpal bone, but bears another most important and powerful action on the first metacarpal bone, viz., it throws it into adduction, and in the meantime places it in extension on the carpus, in a direction nearly opposite to the action of the abductor longus pollicis, and of the principal muscles of the thenar eminence, as we shall soon see.

Lastly, these three muscles act powerfully on the hand, which each muscle carries into the direction it imparts to the first metacarpal bone. The abductor longus pollicis is a flexor muscle of the hand, while the extensor longus has the contrary effect, and the extensor brevis pollicis turns the hand outwards.

Published physiology used to attribute to the abductor longus pollicis the power of producing supination. Electro-physiological experiments induce me to doubt the correctness of this opinion, for it is not possible, as we have seen, to effect supination by artificial contraction of that muscle. Pathological cases will enable us to establish the fact that the muscles moving the thumb are entirely foreign to supination.

Isolated contraction of the abductor longus, or of the extensor brevis muscle, carries the hand also into the direction given by these muscles to the first metacarpal bone. We can well understand, therefore, to what a degree those movements of totality would be troublesome and contrary to the uses of the thumb, if they were necessarily produced by the voluntary moving of the first

metacarpal bone away from the second. Now in the normal state voluntary abduction of the thumb cannot be effected without the synergetic contraction of the ulnar muscles, which are adductors of the hand, instantaneously taking place. The result is, that the hand is solidly fixed during this movement of adduction. The hand is even seen, in this case, to be slightly directed inwards, and the more so when the first metacarpal bone is farther distant from the second, or when the contraction of the abductors of the thumb is effected with greater strength.

The muscular fibres which constitute the muscles *abductor brevis*, *flexor brevis*, and *adductor pollicis*, have been divided into three muscles, and I am of opinion that this is quite an arbitrary division in an anatomical as well as in a physiological point of view; for it appears evident to me, from my electro-physiological researches, that all the fibres inserted on the external side of the first phalanx of the thumb have the same action on the first metacarpal bone and on the two phalanges of the thumb, and that the fibres converging towards the internal sesamoid bone equally possess one sole action, and are almost antagonists to the first.

The whole mass of these muscular fibres constitutes, in a physiological sense, but two muscles, the functions of which I will now lay down.

I.—*Muscular fibres converging towards the outer side of the first phalanx of the thumb, and comprising the abductor brevis muscle, and a portion of the flexor brevis pollicis.*

When by electrical excitation we bring into contraction the fasciculus of the abductor brevis, or that of the flexor brevis pollicis, we observe three different movements in the first metacarpal bone, and in the first and second phalanx of the thumb; for if at that moment the thumb be in its natural attitude[a], free from all muscular action, the first metacarpal bone is directed forwards and inwards (in flexion and in adduction). During this movement of the metacarpal bone the first phalanx becomes flexed, while it inclines sideways, and performs on its axis a slight movement of rotation from within outwards, which brings its anterior surface opposite the palmar surface of the fingers. Lastly, the second phalanx is extended on the first, if it happened to be flexed previously. If the first metacarpal bone be abducted at the moment of the experiment, the adductor movement it performs is greater and takes place by a kind of circumduction. Then again, if the same bone is found brought up by the side of the second metacarpal bone, so as to form anteriorly a protruding angle with the carpus, it is seen to flex on the latter, and form with it a hollow angle anteriorly.

[a] It is known that the natural attitude of the thumb and of its metacarpal bone differs from that of the other fingers: that the palmar surface of the former is turned inwards while the similar surface of the fingers is always directed forwards; that the first metacarpal bone forms externally a hollow angle with the carpus, and that anteriorly it is on the same plane as the radius; and that the first and second phalanges are in a state of slight flexion.

II.—*Muscular fibres terminating at the inner sesamoid bone of the thumb, and comprising a portion of the flexor brevis and the adductor pollicis.*

Under the influence of the electrical contraction of the fibres terminating at the inner sesamoid bone, the first metacarpal bone is drawn towards the second, and becomes external and anterior to it.

This movement of the first metacarpal bone takes place in different directions, according to the position this bone occupied at the moment of the contraction. If the first metacarpal bone was placed in abduction, it moves from without inwards; if it was flexed on the carpus, it performs a movement of extension; lastly, if it was found adducted, it becomes external to the second metacarpal bone.

We see, therefore, that the muscle called adductor pollicis is either an extensor, an adductor, or an abductor, and that the name under which it is known was given to it in an arbitrary manner, and imparts a false idea of its real functions.

The thumb follows in a passive manner the movements of the first metacarpal bone, but at the same time the first phalanx is flexed on the metacarpal bone, while it inclines inwards, and the second phalanx is extended on the first.

III.—*Opponens pollicis.*

The opponens pollicis bends the first metacarpal bone on the carpus, while at the same time it brings it into adduction. It has no action whatever on the phalanges of the thumb. At the height of contraction of this muscle, the thumb, if not acted on by any other muscle, is found on the same level with the index, and its palmar surface is turned inwards, as in the natural attitude.

All these experiments show that there exists a great analogy between the action the muscular fibres going to the outer and inner sides of the first phalanx of the thumb bear on the phalanges of the latter, and the action of the interosseous muscles on the phalanges of the fingers; for all these muscles bend the first phalanges by causing them to incline sideways, that is, in bringing them either into abduction or into adduction; and they extend the last phalanges, which also follow the first in the lateral movements.

In order to appreciate fully the movement of abduction or of adduction of the phalanges of the thumb, it is necessary to maintain the first metacarpal bone flexed on the carpus, the thumb resting in its natural attitude, and then to carry the exciters alternately on the fibres going to each side of the first phalanx of the thumb.

At the moment when the fibres going to the outer side of the first phalanx begin to contract, the first phalanx flexes, and meanwhile the thumb inclines laterally outwards, and its extremity traces a curve, the chord of which measures from an inch and a half to nearly two inches. If then, the thumb remaining in this movement of lateral inclination, the fibres ending at the inner sesamoid bone are made to contract in their turn, the thumb is seen to per-

form a lateral movement in the contrary direction to the preceding one, resumes its natural attitude, and then is slightly inclined on its internal side. In the latter experiment, as in the preceding, the first phalanx is flexed, while the last is extended.

It will also be remarked, that the adduction of the phalanges of the thumb is very limited when compared to their abduction.

Under the influence of the muscular fibres which are attached externally to the first phalanx, the thumb is also seen to rotate on its axis from within outwards; while the fibres going to the inner sesamoid bone give it a rotatory movement in the opposite direction, thus bringing it back to its normal site. These movements of rotation, the importance of which I shall by-and-by elucidate, are not observed, or at least are not appreciable in the fingers when the latter are under the influence of the interosseous muscles. Lastly, if the first metacarpal bone, being held as in the preceding experiments, the fibres attached to each side of the thumb are simultaneously excited, the first phalanx is flexed without performing either any lateral or any rotatory movement, while the second phalanx is extended.

I will endeavour to show the utility or the degree of importance of each of the movements of the metacarpus or of the thumb, as they are effected under the influence of the muscles of the thenar eminence.

Three muscles of this region are adductors and flexors of the first metacarpal bone,—viz.: the opponens pollicis, the extensor brevis pollicis, and a fasciculus of the flexor brevis. The first appears to be the least adductor of the three; but supposing these three muscles to produce this movement in the same degree, let us examine the position of the thumb when its metacarpal bone is arrived at its maximum of adduction and of flexion, and when its phalanges are not solicited by any power whatever[a].

The thumb is placed on the level of the first finger only, and its palmar surface looks inwards and very slightly backwards, so that it is not in opposition to the fingers. In this position the thumb cannot go to meet the other fingers, a circumstance which would render the uses of the fingers and thumb very restrained, if the phalanges of the latter could not be carried more inwards.

Now, it is shown by my experiments that this is the limit of the opponens pollicis, the least opposing as it is evident, and the least useful of the muscles of the thenar eminence. But if the first phalanx of the thumb comes to perform its movement of lateral inclination and of rotation on its longitudinal axis by the contraction of the fibres going to the external side of the first phalanx, the extremity of the thumb will successively meet each of the fingers by opposing to them its palmar surface, and this will be the more easily

[a] This experiment can be made on one's self by getting the metacarpal bone held in adduction and in flexion. Volition could not produce this isolated movement of the metacarpal bone without acting at the same time on the phalanges of the thumb.

effected, as the power producing this movement of abduction[a] will simultaneously bend the first phalanx and extend the last.

Of the two fasciculi which incline the thumb laterally, the one constituting the abductor brevis effects this movement with less energy, and less completely than the fasciculus belonging to the flexor brevis. The movements of lateral inclination performed by the muscular fasciculi, ending at the inner sesamoid bone, are destined, as will be understood, to bring the thumb into proximity with each of the fingers.

The last phalanx of the thumb has three extensors unable to fulfil mutually the functions of one another in the divers uses of the thumb, for each of these muscles acts in a contrary manner on the first metacarpal bone and on the first phalanx. Thus:—1st. The same muscle (extensor longus) extends the two phalanges of the thumb and the first metacarpal bone. 2nd. The same muscle (adductor pollicis) brings the first metacarpal bone near to the second by bending the first phalanx, and by causing it to incline on its external side, while it extends the second phalanx. 3rd. Lastly, the same muscle (abductor brevis, flexor brevis pollicis) bends the metacarpal bone and the first phalanx by inclining the latter on its external side, while it extends the last phalanx. These latter movements of the thumb and of the first metacarpal bone are the most frequently met with in the uses of the hand. To be able to explain their mechanism it was necessary to admit that the extensor longus pollicis extended the last phalanx during flexion of the first and of its metacarpal bone. But this intervention of the extensor longus would have created an antagonism for the muscles, producing flexion of the first phalanx and of the first metacarpal bone, and the result would have been a great impediment to the ease of these movements.

From the *ensemble* of the preceding facts and considerations, it is clear that none of the muscles of the thenar eminence can justify its name, drawn from the functions attributed to it.

Thus, for instance, the *opponens pollicis* muscle is the least opposing one among the muscles which bring the first metacarpal bone into flexion and adduction.

The *abductor brevis pollicis* inclines, it is true, the first phalanx on its external side, and consequently produces abduction of the thumb; but the muscle called *flexor brevis* effects a similar action, and moreover, produces at the same time adduction of the first metacarpal bone and extension of the last phalanx.

The *flexor brevis* bends the first phalanx, but it also extends the last one; it must, therefore, be termed *flexor* and *extensor*, and additionally, *abductor* and *adductor*.

We have seen that the *adductor* muscle can be abductor and ex-

[a] In this attitude of the first metacarpal bone the external side of the thumb inclines towards the internal side of the hand, and consequently performs an adductor movement; but it is agreed that every movement of the thumb on its external side must be termed one of abduction.

tensor of the first metacarpal bone, adductor and flexor of the first phalanx, and extensor of the last one. From which of all these actions should this muscle derive its name?

In order that the mechanism of these movements should be better understood, I will give the analysis, as I did for the fingers, of the movements performed by the thumb and its metacarpal bone during the operation of writing or drawing, &c. For drawing the line antero-posteriorly the last phalanx of the thumb is flexed, and the first one extended, while the first metacarpal bone is abducted. The contrary takes place if the line be conducted postero-anteriorly. This mechanism is absolutely the same as that of the movements of the fingers guiding the pen or the pencil. We find also the same independence in these movements when made in inverse directions, for the abductor longus and the extensor brevis pollicis, while they effect abduction of the first metacarpal bone and extension of the second phalanx, are not antagonist to the flexor longus pollicis; on the other side the same muscles (abductor brevis and flexor brevis), acting in the manner of the interosseous muscles, produce at the same time and at the same moment flexion of the first phalanx, extension of the second, and adduction of the first metacarpal bone. The extensor pollicis longus might have deranged this ingenious mechanism, but fortunately that muscle remains quite foreign to the movements just analyzed.

To complete these electro-physiological studies I ought to lay down the action of each of the muscles of the hypothenar eminence; but I have found in that region only one new physiological fact deserving notice,—viz., that the abductor and short flexor muscles of the little finger act on the phalanges in the same manner as the interosseous, abductor brevis, and flexor brevis pollicis,—namely, that they bend the first phalanges while they extend the two last. I must, however, observe that their action on the two last phalanges has appeared to me to be a little less decided than that of the other muscles.

[Want of space compels us to hold over until our next Number the concluding and most interesting portion of this paper, comprising the pathological facts in support of Dr. Duchenne's experiments.—Ed.]

Observations on the "Réducteur à Air" of M. Favrot. By Charles Halpin, M. D., F. R. C. S. I., Cavan.

In a notice of the instrument of M. Favrot contained in the Number of this Journal for May, 1852, reference is made, at page 387, to a paper of mine on this subject, which was read before the Obstetrical Society of Dublin on the 2nd of January, 1840, and which was published in the Number of the former Series of the Dublin Journal for March, 1840. The "*Réducteur à Air*" has therefore been before the profession in this country for upwards of twelve years, and has been em-

ployed with success by some distinguished members of the profession. The instrument I used before the Obstetrical Society to demonstrate the action of air on the retroverted uterus was an Indian-rubber bladder attached to the tube of a stomach-pump. It served my purpose on that occasion, but I have doubts that it will be found to answer in practice. The drawings of M. Favrot look very well on paper, but when we come to deal with a case of retroverted uterus, especially if the misplacement has continued for some days, we shall, most probably, encounter difficulties that those diagrams convey no idea of; and it will very frequently be found that the sphincter ani is in such a state of irritation that the introduction of one finger, even with the utmost gentleness, produces an amount of distress and pain not easily to be borne by the patient. A caoutchouc bladder, with walls thick enough to bear a pressure of air that may be necessary to restore the uterus to its normal position, will be found too clumsy to admit of its easy introduction into either the vagina or rectum. This is my experience. Again, a practitioner may not always be prepared with one of these Indian-rubber instruments, whilst a bladder may be procured in every locality, which, with the aid of a tube of any description, may be prepared for use in a moment.

The bladder may be introduced into the vagina without causing the slightest pain, and will bear any amount of pressure that can possibly be required.

In February, 1847, I was called to visit a lady living about fourteen miles from Cavan; on arriving at her house I found her to be labouring under retroversion of the uterus, which had existed for four days. She was suffering intense pain in the region of the pelvis; her stomach rejected all food; there was also present that extreme anxiety of mind which is found to attend cases of this affection. On leaving home I had no idea of the nature of the case; and on discovering the condition of the patient I was too far from home to send for my instruments. Under these circumstances, the case being very urgent, I procured a bladder and a male catheter from the family apothecary, and with the simple apparatus these enabled me to construct, I found no difficulty whatever in getting the uterus out of the pelvis. The empty bladder, attached to the catheter, was introduced into the vagina, as in my former case, and was then inflated by the mouth through the catheter. A recent bladder, if procurable, is to be preferred, but if this cannot be had, a dried bladder will answer the purpose very well; but previous to introducing it into the vagina it should be soaked for some time in warm water, which will render it soft and pliable. I have been apprized that this simple process has been successful in many cases in these countries. I am not personally acquainted with the distinguished surgeon from whom I received the following note:—

"Dundalk, 18*th Oct.*, 1844.

"Sir,—As I am sure you will be gratified to hear of the success of the mode of treatment proposed by you to remedy a retroverted

uterus, I beg to inform you that I tried inflation of the vagina in a patient in the County of Louth Infirmary a few days ago, whose case was a very urgent one, and I am happy to say with almost immediate success, and relief of all the urgent symptoms,—though *all* the usual manœuvres to rectify the uterus were diligently made use of previously, with no avail. I certainly should not hesitate at once to inflate the vagina in a similar case, without having recourse to any other expedient.

"Your obedient servant,
"E. G. Brunker, M. D.,
"*Surgeon to Louth Infirmary.*"

To Dr. William Hunter belongs the merit of having first called attention to this disease as "retroversion of the uterus"[a]; but the affection had been previously noticed, and accurately described, by Smellie in his "Treatise on the Theory and Practice of Midwifery"[b], where he gives details of the symptoms of four cases very carefully, together with the treatment, which consisted in "repeated blood-letting and glysters, with the assistance of the catheter." They all recovered.

Case of Undetected Injury of the Orbital Plate of the Frontal Bone, terminating fatally. By Richard Montgomery, M. B., F. R. C. S. I., Surgeon to the Ardee Dispensary.

On the 28th of April 1852. John Clarke, fifteen years of age, was accidentally struck in the inside of the left eyelid, as he was stooping, by a fellow-labourer, with a three-pronged fork curved at the point, called a grope, which is used for loading dung-carts. He did not fall, and was able to walk home, a distance of about two miles, after the accident; his eye was washed, and as he did not complain much, nothing was done for him except bathing the injured part.

On the 1st of May he presented himself at the Ardee Dispensary, when there was considerable inflammation of the upper lid of the left eye: it was tense, and of a scarlet redness. On partially raising the lid, which was done with difficulty, a slight appearance of a wound of the lining membrane was visible near the external canthus; this was clean, and the eye itself uninjured; there was apparently no external wound, and there was no symptom of internal inflammation, or of injury of the brain. Four leeches were applied in the neighbourhood of the eye, and the parts were afterwards well fomented. An active purgative was also prescribed for him.

May 4th. I was informed that the symptoms continued as when I saw him, and that the swelling had not abated; a lead lotion was ordered, and the purgative repeated. After this day I received no account of the boy at the Dispensary.

[a] "Medical Observations and Inquiries," vol. iv. 1771.
[b] Vol. ii., Collection x., Cases Nos. 1 and 2. 1754.

10th. He was visited at his own house by another medical man. Symptoms of pressure on the brain were then evident, the pupils of the eyes were dilated, but the eye was not inflamed; he complained of acute headach, yet spoke coherently and rationally; there were no convulsions, and his breathing was natural; some redness remained on the outside of the eyelid, but the external appearances of the injured part were not such as to attract much attention, and he had been able to get up and walk about every day. His death took place on that night, he spoke to his father a short time before, when he turned on his side, and expired calmly.

A post-mortem examination, 42 hours after death, revealed a wound of the orbital plate of the frontal bone, large enough to admit the point of a dissecting forceps; three spicula of bone were detached and loose in it. The point of the fork had passed obliquely upwards and inwards, penetrating the orbital plate about an inch from the base of the orbit. More than a teaspoonful of pus was seen on raising the brain, and pressure on the eye caused it to well up through the aperture in the orbit as well as behind the eyeball; the brain itself was uninjured, but there was considerable and extensive inflammation of the membrane.

In this case, until the very day of the boy's death, danger was not apprehended by his family; and when seen by me, no symptom calculated to excite alarm existed.

I think the case worth placing on record as constituting an interesting addition to those cases of undetected injury of the brain which were published in the Number of this Journal for May, 1851.

On the Use of Iodide of Sodium in the Treatment of Constitutional Syphilis. By Dr. Pietro Gamberini, Assistant Physician to the Hospital of Saint Orsola, in Bologna.

Dr. Ubaldo Daveri, Chief Physician of the Hospital of Saint Orsola, was induced to employ the iodide of sodium instead of the corresponding salt of potassium, in consequence of some remarks on the subject contained in Ruspini's Eclectic Manual of New Remedies, where the use of the former preparation is suggested, not only because it is probably more directly assimilable to the human system, —soda being found in almost all the animal fluids,—but also because it is less repugnant to the palate, and entirely free from the acrid and ley-like taste of the potassium salt. The iodide of sodium employed by Dr. Daveri was prepared according to Ruspini's directions, by placing three ounces of filings of iron in two and a half pounds of distilled water, and gradually adding, with constant agitation, a pound of iodine; as soon as the mixture had acquired a greenish colour, it was filtered, and quickly treated with a solution of carbonate of soda until all the iron was thrown down. The carbonate of iron thus formed was separated by filtration, the filtered fluid eva-

porated to dryness, and the residuum again dissolved, filtered, and evaporated until a pellicle had formed. By this method, fourteen ounces of iodide of sodium were procured in the form of white rhomboidal prisms, deliquescent, and having a saltish taste less disagreeable than that of iodide of potassium.

The iodide thus prepared was found to answer much better than that made from iodine and caustic soda, the salt procured by the latter process being not only disagreeable to the taste, but giving rise to a burning sensation in the fauces, to weight and uneasiness in the stomach, and to gastro-enteric pains,—effects attributed by the author to an excess of iodine which the salt was, by analysis, found to contain.

The dose administered at the commencement of the treatment was always a scruple of the iodide dissolved in three ounces of distilled water, and given in three equal portions in the course of twenty-four hours. The salt was likewise employed, in the form of ointment, in the proportion of half-a-drachm or a drachm to the ounce of lard. In the administration of the iodide of sodium, the same rules and precautions are to be observed as apply to the use of the potassium salt. Although the author, for reasons and facts set forth in his Manual of Venereal Diseases, repudiates the distinction of constitutional syphilis into secondary and tertiary, he divides the 116 cases, on the observation and treatment of which his present paper is based, into the three following classes:—

1. Cases of constitutional syphilis in which so-called secondary and tertiary phenomena co-existed.

2. Cases of so-called tertiary lues in which the use of mercury preceded the treatment by iodide of sodium.

3. Cases of so-called tertiary lues in which iodide of sodium alone was employed.

Of the first class, twelve cases, in which the symptoms were pains in the bones or periostitis, united with some manifestly constitutional affection of the skin, generally of a papular or pustular form, were treated with iodide of sodium. In eight of these cases the use of the salt alone effected a cure; in the remaining four it was necessary to have recourse to mercurial frictions to remove the cutaneous affection which remained after the tertiary symptom had yielded to the administration of the iodide. The minimum quantity which succeeded in curing the disease was three drachms, the maximum, three ounces; the quantity which was usually required ranged from two to three ounces: the shortest time in which the symptoms were removed was nine days, the longest three months, the average was about a month.

The author thinks it possible that the four cases in which the iodide of sodium thus appeared to fail might have yielded to a longer perseverance in the use of the salt. This was, however, precluded by the circumstances of the individual cases.

The cases of the second class, or those of so-called tertiary lues, in which the use of mercury preceded the treatment by iodide of

sodium, were seventeen; in some of these, six or seven ounces of stronger mercurial ointment had been rubbed in; the average quantity was from four to five ounces. The minimum quantity of iodide of sodium administered was three drachms, the maximum, four and a half ounces, the average from one to two ounces. It is most important to observe, that those patients who had derived no benefit from a protracted course of mercurial treatment, were cured after the administration of a small quantity of iodide of sodium; while this remedy had to be given to the extent of four and a half ounces in cases in which only a limited number of mercurial frictions had been used: the patients who resisted the long-continued employment of the ointment laboured under osteocopic pains, which subsequently gave way to a small quantity of the iodide; while those who practised without benefit a moderate number of mercurial frictions suffered either from syphilitic rheumatism, or from a mixture of syphilis and scrofula. This fact of the iodide being required in the inverse ratio of the amount of mercury previously employed arises, the author thinks, from this,—that in the first case the use of mercury had in a great measure overcome the syphilitic element, which was then entirely removed by the administration of the iodide; while in the second, the elimination of the constitutional venereal principle commenced by the mercury was, for the most part, reserved for the iodide of sodium; and he points to a therapeutic consonance between the two agents, corroborating an opinion formerly advanced by him that the iodides of sodium and potassium are the best substitutes for mercury, as they are about equally efficacious with it in the treatment of so-called tertiary phenomena.

In support of this view, the author quotes the following cases:—

Case I.—Vincenzo was admitted into hospital on the 20th November, 1850, labouring under ostalgia: he first used two ounces, one drachm and eighteen grains of iodide of potassium; then five ounces and five scruples of iodide of sodium; the pains continuing, he had eleven inunctions of two drachms of mercurial ointment each, and twenty-two vapour baths, to which treatment the symptoms completely yielded.

Case II.—Antonio, admitted for pains in the bones, 15th August, 1851: two ounces of iodide of sodium having been given without producing any relief, mercurial inunctions with vapour baths were had recourse to, and the ostalgia was completely removed after the use of two ounces of ointment.

The cases belonging to the third class, comprising those of so-called tertiary lues, in which the iodide of sodium was the only medicine administered, were eighty-five in number; of these, thirty-seven were cases of ostalgia, in the treatment of which vapour baths and iodide of sodium were employed; the minimum quantity of the latter given was from one to seven drachms, the maximum from eight to twelve ounces, the average from two to four ounces. Of rheumatalgia the cases were seventeen—likewise treated with vapour baths and the iodide; the minimum dose of the latter being from

two to four drachms, the maximum nine ounces, the average two to four ounces. Of arthralgia nine cases were similarly treated, the minimum quantity employed having been seven drachms, the maximum two ounces. Of the other varieties of tertiary disease, the numbers were too limited to require special mention, or to justify the deduction of conclusions from them.

The inconveniences which frequently attend the use of the preparations of iodine, and amongst them of iodide of potassium,—such as derangement of the stomach, iodic eructations, ptyalism, and affections of the throat, were seldom met with from the time the iodide of sodium was substituted for the potassium salt; consequently the remedy could be more steadily persevered with, and its dose more rapidly increased; circumstances directly promoting the cure of the diseases for which it was administered. In the few cases in which ptyalism occurred, it totally ceased on suspending the medicine for two or three days. In but a single case did it appear to be obstinate; and in this instance the mouth was, on examination, found to be pale, free from swelling, and very slightly painful; as the patient lay in a ward with many syphilitic patients under mercurial treatment, it was thought the salivation might be owing to mercurial vapour present in the atmosphere, a suspicion which was verified by the result; for on removing the patient to another apartment free from mercurial contamination, the salivation entirely ceased in two days.

At the time the author drew up the report of the first experiments with this salt, Dr. Lesi, Assistant Physician to the Hospital of Saint Orsola, had noted that the mean time required for the cure of nineteen patients treated with the iodide of sodium was about twenty-eight or twenty-nine days, while with the potassium salt, likewise exhibited in nineteen cases, the average time was from thirty-four to thirty-five days. Many cases which had either not got entirely well, or were proceeding but slowly under the use of the iodide of potassium, were rapidly cured by the substitution of the corresponding salt of sodium.

Several of the cases, however, treated with iodide of sodium relapsed, and the disease again yielded sometimes to a repetition of the remedy, sometimes to the use of mercurial frictions. But this circumstance cannot be urged against the iodide of sodium alone; for the same is equally true of every other anti-venereal remedy,—one of the leading features of lues being its tendency to present periods of lull and of relapse, whatever be the therapeutic means employed to combat the constitutional taint from the first moment of its manifestation to the last evidence of specific disease.

The author concludes his paper with the following *resumé*:—

1. Soda being a very common ingredient in our organism, the iodide of its base appears best suited to the human system.

2. The taste of theiodide of sodium is much less disagreeable than that of the iodide of potassium.

3. It is less likely to occasion iodism.

4. It is better borne than the potassium salt, and in consequence of this its dose can be almost daily increased, and it thus becomes a more efficient remedy.

5. It has sometimes succeeded where the iodide of potassium had failed.

6. We may commence by giving daily, in three equal doses, a scruple of the salt dissolved in three ounces of distilled water, increasing the strength of the solution every two or three days by six grains. Some patients have in this way been able to take more than two drachms a day without suffering the slightest inconvenience.

7. The iodide of sodium is admirably adapted to cases in which the corresponding salt of potassium is indicated.

8. The iodide of sodium is the best substitute for mercury.—*Corrispondenza Scientifica di Roma*, No. 32. 1852.

On Suppuration in the Mastoid Process in Children. By Dr. Riecke, of Berlin.

The formation of pus in the ear is not unfrequent in scrofulous children, but the extension of the suppuration to the mastoid process of the temporal bone is rare. I shall here describe some cases in which the mode of this occurrence appears to me to be still more interesting than the occurrence itself.

M. v. E., a weakly child of scrofulous tendency, and excitable nervous system, in January, 1835, while playing in stormy weather in the open air, was seized with most violent pain in the right ear. She became somewhat feverish, and the attack appeared to consist merely in a slight cold affecting the ear. Mild diaphoretics, little bags of warmed herbs laid upon the ear, a warm bed, and a small blister to the nape of the neck, soon gave relief. After some days a brownish-yellow thin discharge took place from the right ear, which in the course of a few days more became whitish and thicker, and lasted a fortnight. It then entirely ceased for a fortnight, the patient being in other respects well; nevertheless the violent pain increased, without external cause, and the secretion from the ear subsequently set in again. The discharge did not diminish under the employment of stronger derivative measures, such as blistering and purgatives, the pain, however, disappeared. In the beginning of April, the skin covering the mastoid process behind the right ear began to swell, to be tender, and to assume a reddish colour. Pain and fever again set in. Leeching and the application of mercurial ointment gave relief; a greater discharge again took place from the ear, and the patient hawked up, especially on awaking in the morning, much purulent matter. Alterative medicines were exhibited, and the case was going on well. The swelling and pain in the mastoid process diminished. Fourteen days after, a swelling again suddenly took place, while the discharge from the ear ceased. The tumour was so large that it threatened to break, and I thought I could distinguish with the touch through the soft swelling the ex-

panded laminæ of the bone. I now meditated opening the tumour, but at one time the dread of the knife manifested by the little patient and her friends, at another the apprehension that the probably unfavourable result would be attributed, as it so often is by the ignorant, to surgical interference, prevented me doing so, a policy not blamable in a young practitioner, especially where there is no pressing indication to use the knife. Injection into the ear and the application of warm emollient poultices to the parts were now repeated in order to re-establish the discharge. At length the discharge from the ear suddenly recommenced; during the following night the little patient again brought up a quantity of bloody pus, and the great external swelling of the mastoid process as suddenly disappeared. The discharge from the ear continued until the middle of May, it was reported to have been fetid during the entire of one day; with this exception it was free from smell. On a sudden a swelling of the mastoid process took place within a few hours, attended as before with a cessation of the discharge from the ear. It was easy to feel fluctuation under the laminæ of bone covered by the thin integuments, and the tumour appeared this time to be decidedly about to open. Nevertheless, a purulent discharge was again established from the ear and throat; the mastoid tumour quickly diminished; and by the end of May the discharge had entirely ceased both from the ear and throat. Hearing continued unimpaired, so that in the month of June the patient's recovery was complete.

This was one of the rarer cases of affection of the ear in which the pus flows through the Eustachian tube to the throat. It may certainly often occur without being observed, for in the day-time the discharge is generally swallowed by the little patients; it is only in the morning, when it collects in greater quantity, that it is brought up. The case should also teach us not to be overhasty in opening such tumours externally, a proceeding which might induce the establishment of a tedious caries, and leave behind it a disfiguring scar. The following affords an additional illustration of the truth of this view.

In the April of the same year, the wife of a wind-miller brought me her son, aged four years, who was suffering from caries of the mastoid process. On inquiry into the history of the case I ascertained that he, likewise in the month of January, 1835, was attacked with pain in the ear, otorrhœa, and swelling of the mastoid process, which finally burst, without medical assistance having been sought. The child being otherwise in good health, the sore healed in a few months without other treatment than attention to cleanliness. A year subsequently his head was crushed by the sail-beam of the windmill, and he died in an hour after the injury. On dissection I examined the mastoid process. There was a deep tortuous canal of the size of a crowquill, which involved the internal layers of the temporal bone, and was lined by a thin membrane covered with a brown greasy, fatty matter. The cells of the mastoid process

which were not touched by this canal were in their normal condition; those situated in its neighbourhood had grown into union with it.

It is remarkable that in the month of April a third patient, the son of a brick-burner, was brought to me with a fistula in the mastoid process, which dated its origin from an attack of acute earache, caused by exposure to severe weather in the preceding January. All three patients, it was proved, had brought on the attack on a very stormy day; the first, in a play-ground adjoining a highly located church; the miller's son in the neighbourhood of the mill, likewise in an elevated situation; the son of the brick-burner in the exposed locality of the tiler's hut. It appears to me remarkable that, although I have during thirty years had much experience, no similar case should have occurred to me either before or since those I have detailed. Three cases of an undoubtedly rare affection arising at once, and, so to speak, even in one day, almost point to an epidemic origin. Acute and violent earache in children, who pass from a warm room into a severe and piercing January wind, is a frequent occurrence, but it is certainly rare and remarkable that in each of these three patients, the affection should have had the same unusual termination in suppuration of the mastoid process. I may also observe that my case-book at that time contains no history of any affection of the ear but the three given above.

It would not be uninteresting in reference to the theory of the origin of epidemic diseases, if other physicians had experienced something similar at that period, and would record their observations. Since we now know that the air is at times impregnated with matters (ozone) which have an irritating effect on ther espiratory passages, a strong current of air pressing into the ear may, if it contains an irritating principle, excite in this organ very peculiar affections. In natural science every observation is of value, and often finds its explanation only after the lapse of years, or even of decennial periods. For this reason it may be useful to have recorded the foregoing cases; besides they afford instructive proof that in abscess of the mastoid process we should not hastily have recourse to the knife, and they also show that we need not very much dread the occurrence of caries if we take care to avoid employing means which may be productive of injurious consequences. My patients recovered under simple treatment.—*Journal für Kinderkrankheiten*, March and April, 1852, p. 180.

On the Laws which influence the Secretion of Sugar in Diabetes. By Dr. Moritz Traube.

It has hitherto been thought sufficient to determine the quantity of sugar contained in the urine, either by analyzing that passed in the morning, or by extracting the saccharine matter from the entire amount evacuated during the twenty-four hours. There are, however, various circumstances in the diurnal life of the patient which may exercise a marked influence on this pathological secretion, the

effects of which cannot be observed by following either of the above plans. Led by these considerations, Dr. Moritz Traube has in his researches pursued a method different from that adopted by other observers, and has thus obtained results which deserve to be briefly explained.

The patient on whom his observations were made was a young man of 28, who had for a short time laboured under diabetes. Of the ordinary symptoms of the disease, the best marked were the excretion of highly saccharine urine, extreme thirst, great increase of appetite, irregularity of the bowels, and disturbed sleep. Emaciation, however, had made but little progress, nor was there much perceptible dryness of skin. His regimen was so directed as to exclude as much as possible all amylaceous food. The urine was analyzed twenty-five times from the 1st to the 7th of January, and the following are the principal conclusions deduced by the author from his experiments:—1. The proportion of sugar contained in the urine was very different, according to the period of the day at which it was passed, varying from 225 grains to 26 grains in 100 cubic centimetres (39.3708 cubic inches, equal to 22 fluid ounces and 6 drachms nearly). This fact proves how little can be inferred of the intensity of a case of diabetes from analyses conducted in the ordinary mode. 2. The quantity of sugar secreted was liable to remarkable oscillations,—the maximum was 88 grains in the hour, the minimum rather more than $2\frac{1}{2}$. 3. The amount of sugar was very sensibly augmented for a few hours after a hearty meal. 4. If the patient remained eleven hours without taking nourishment, it decreased so rapidly that during the last seven hours of this period a very insignificant quantity only could be found,—less than 3 grains, for example, instead of upwards of a drachm, in the hour. 5. Usually no sugar was excreted during the latter hours of the night; that is to say, at as long an interval as possible after a meal. 6. Almost all the sugar was derived from the meals, and disappeared after digestion was completed.

Five months subsequently, the patient, very much emaciated, and with greatly increased suffering, placed himself under the treatment by the Carlsbad water, and adopted a stricter regimen. The effect of this double plan was to produce a considerable improvement; his thirst and appetite were again restrained within nearly natural limits, and the excretion of urine was much diminished. Except that sugar was still proved to be present, the patient no longer presented any of the symptoms of diabetes. The analyses, repeated from the 26th June to 16th July, furnished the following results:—1. The proportion of sugar varied from 2 drachms to 17 grains in 100 cubic centimetres (22 fluid ounces and 6 drachms, nearly) of urine. 2. The quantity of sugar excreted was greater than in the preceding experiments,—the minimum being $24\frac{1}{2}$ grains, the maximum rather more than three drachms. 3. It increased in proportion as the urine was examined nearer to a meal, and diminished according to the length of time which had elapsed after one;

but no urine was now found, as formerly, free from sugar. 4. When a long time had elapsed without the patient having taken nourishment, the oscillations already described were no longer observed; the quantity remained stationary at about 45 grains. 5. There are two stages in diabetes: during the first, all the sugar contained in the urine is furnished directly by the ingesta; during the second, the sugar is not derived solely from the food, but is the result of a peculiar secretion of the liver. 6. In order to estimate the intensity of a diabetes, the urine must be analyzed in the morning, before a meal has been taken: if it is free from sugar, the disease is in the first stage; if it contains saccharine matter, the diabetes is in the second stage, and is advanced in proportion to the quantity of sugar voided in each hour. 7. As to treatment, the alkaline carbonates, administered in the form of Carlsbad water, while they modified certain symptoms, did not exercise any influence on the intensity of the disease.—*Archiv. für Heilkunde, von Virchow. Nouvelle Encyclographie des Sciences Médicales*, April, 1852, p. 262.

On the Hemostatic Effects of the Eau Pagliari. By Professor Sédillot.

The formula for the preparation of the styptic water, invented by Signor Pagliari, an apothecary at Rome, and which has attained a high celebrity on the Continent, is thus given by Professor Sédillot, to whom it was transmitted by the inventor:—

Take of benzoin, eight ounces; sulphate of alumina and potassa, one pound; water, ten pounds. Boil together in a glazed earthen vessel for six hours, constantly stirring the resinous mass, and supplying the loss by evaporation by successive additions of hot water, so as not to interrupt the ebullition. Finally, filter the liquid, and preserve it in well-stopped glass vessels. The portion of benzoin which remains undissolved will be found to have lost its odour and inflammability.

The hemostatic water thus obtained is limpid, resembles champagne in colour, has a slightly styptic taste, and a sweetly aromatic odour. It leaves, on evaporation, a transparent deposit, which adheres to the sides of the vessel.

The following are the conclusions deduced by M. Sédillot from his experience of this and other styptics:—

1. There are fluids which instantaneously coagulate the blood, and convert it into a thick, homogeneous and consistent clot.

2. The eau Pagliari enjoys this remarkable property, and does not exercise any injurious action on the tissues with which it comes into contact.

3. Theory, experience, and clinical observation equally concur in demonstrating its efficacy as a styptic.

4. The object of compression, in the application of hemostatic liquids, is to permit the coagulation of the blood, as well as the adhesion of the clot to the mouths of the wounded vessels.

5. In all cases in which recourse cannot, without serious incon-

venience, be had to ligature, as well as in those in which the alteration of the blood prevents its coagulation, and renders hemorrhage dangerous, the eau Pagliari may be advantageously employed, and deserves to be classed among the valuable resources of our art.—*Gazette Médicale de Strasbourg*, May, 1852.

Special Pharmacopœia for Diseases of the Skin. By Alphée Cazenave, M. D., Physician to the Hôpital St. Louis, Paris.

(*Continued from* p. 256.)

Baths. — Baths constitute some of the most valuable means in the treatment of simple or syphilitic diseases of the skin. They may all, or almost all, be employed in various ways, from the liquid bath of pure or medicated water to the dry or moist vapour-bath.

Emollient Baths.—Emollient herbs[a], four pounds; flaxseed, half-a-pound; water, five quarts;—boil, strain, and express. To be poured into the water for the bath. This bath is indicated in all cases of acute eruption, in the treatment of the exanthemata, of eczema, and of lichen agrius; and it will also prove serviceable whenever an exacerbation or relapse occurs in the course of a chronic eruption. The temperature should be about 95° Fahr.; the duration from half-an-hour to an hour. It is sometimes useful to continue it for several hours. *Gelatine Bath.*—Gelatine (size), eight ounces; hot water, one pint; dissolve with constant stirring, and add it to the water for the bath. The uses are the same as those of the emollient bath. *Bath of Bran.*—Bran, four pounds; water, six quarts;—boil for a quarter of an hour, strain, and add it to the water for the bath, or the bran may be put in a bag and plunged into the bath. *Use*, the same as of the preceding two. *Alkaline Bath.*—Carbonate of soda of commerce, four ounces; water sixty-six gallons. Dissolve the salt in a little warm water, and pour the solution into the water for the bath. This bath is used in the greater number of cutaneous diseases, such as lichen, psoriasis, prurigo, &c. *Vichy Bath.*—Bicarbonate of soda, thirty-two ounces; chloride of sodium, one ounce; chloride of calcium, sulphate of soda, of each five ounces; sulphate of magnesia, one ounce and a half, sulphate of iron, half-a-drachm—mix, for a bath of sixty-six gallons. The salts are to be kept in a bottle, and added to the water immediately before the bath is required. The uses of this bath are similar to those of the foregoing.

Dr. Lugol's Ioduretted Baths.

For Adults:—	I.	II.	III.
Iodide of potassium,	15	20	24 parts.
Iodine,	8	10	12 ,,
Water,	625	625	625 ,,

[a] Equal parts of the herbs of the mallow and melilot, chamomile flowers, marsh-mallow root, and flax-seed.—Ed.

For Children:—	I.	II.	III.
Iodide of potassium,	5	6	8 parts.
Iodine,	2.5	3	4 ,,
Water,	300	300	300 ,,

This bath requires a wooden vessel. *Bath of Iodide of Potassium* (Dorvault).—Iodide of potassium, one ounce and five drachms; distilled water, fifteen ounces; make a solution which is to be poured into a bath full of water. This is intended for adults; it is not absolutely necessary that the vessel for this bath should be of wood. *Bath of Ioduretted Iodide of Potassium.*—Iodine, two and a half drachms; iodide of potassium, one ounce and two drachms; distilled water, fifteen ounces; to be made in the same manner as the preceding bath. This solution requires a wooden bath. These baths are useful in cases of lupus of the limbs, in the treatment of scaly diseases, and of secondary syphilitic affections. *Mercurial Bath.*—Corrosive sublimate, from two to four drachms; distilled water, sixteen ounces; dissolve and pour into a wooden bath containing a sufficient quantity of water. It has been most frequently employed in chronic affections of the skin, whether simple or syphilitic, and incorrectly as a general alterative. It is an uncertain remedy, and one which can never produce more than a local action. *Soap Bath.*—White soap, thirty-two ounces; water, three quarts; dissolve and add to the water for the bath. It is useful in the treatment of scabies, prurigo, and psoriasis. *Bath of Sea-salt.*—Common salt, thirty-two ounces; water, a sufficient quantity. This bath may be advantageously used in scrofulous diseases, in lupus, in the hypertrophiæ, in scrofulous ulcers, and in the sequelæ of syphilis. *Gelatino-saline Bath of Plombières.*—Carbonate of soda, 58.5 parts; sulphate of soda, 37.8; chloride of sodium, 10.9; chloride of calcium, 17.7; gelatine, 17.6. The salts for these baths are generally sent in the form of a limpid solution, the gelatine separately in a small flask. The gelatine is to be dissolved before being added to the water for the bath. I often employ this bath as a discutient in the treatment of diseases of the skin. It is particularly efficacious in the forms attended with pruritus, and with slight oozing, as eczema, lichen, and pityriasis. *Sulphur Bath.*—Sulphuret of potassium, four ounces; water, sixteen ounces; dissolve, filter, and keep until required in a well-stopped bottle. This bath is one of those most frequently employed in the treatment of cutaneous diseases; it is admissible only in chronic affections, and is especially useful in scabies, prurigo, chronic psoriasis, lepra, eczema, and impetigo. *Gelatino-Sulphurous Bath.*—Sulphuret of potassium, four ounces; water and gelatine, of each sixteen ounces: the gelatine should be previously dissolved in three or four quarts of warm water. This bath is used in the same cases as the preceding. *Artificial Baréges Bath.*—Crystallized hydro-sulphate of soda, chloride of sodium, and crystallized carbonate of soda, of each two ounces, water ten ounces; dissolve. *Uses* similar to those of the preceding. *Vapour Bath.*—This is either administered in an apparatus adapted for

the purpose, and which excludes the head, or, still better, in a small apartment furnished with steps, and into which the generator sends the vapour. It is one of the most frequently employed and most useful means in the treatment of the majority of chronic diseases of the skin, whether simple or syphilitic; above all, it is a powerful auxiliary in the management of dry eruptions, psoriasis, and lepra vulgaris. The vapour bath in a special apartment is much to be preferred. The temperature should not exceed 104° F.; nor should the patient remain in the bath for more than a quarter of an hour. Douches of vapour, or partial vapour baths, are also frequently employed. The vapour is directed to the parts affected by means of a tube, which is brought more or less close according to the sensibility of the surface, and the effect it may be desirable to produce. The uses, and the length of time they should be applied, are the same as those of the vapour bath. *Alkaline Foot Bath.*—Carbonate of potash, four ounces; water, a sufficient quantity. Used in plantar, psoriasis, and in pruritus affecting the toes.—*Annales des Maladies de la Peau et de la Syphilis*, tom. iv. 1852.

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